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THE CENTURY:

ITS FRUITS AND ITS FESTIVAL.

BEING A HISTORY AND DESCRIPTION OF

THE CENTENNIAL EXHIBITION,

WITH A

PRELIMINARY OUTLINE OF MODERN PROGRESS.

By EDWARD C. BRUCE.

WITH NUMEROUS ILLUSTRATIONS.

PHILADELPHIA
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Horticultural Hall. Memorial Hall. Main Building.
Agricultural Building. Government Building. Machinery Building.

GENERAL VIEW OF THE CENTENNIAL EXHIBITION GROUNDS, FROM GEORGE'S HILL, SHOWING THE PRINCIPAL BUILDINGS.

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PREFACE.

WHAT there was to celebrate at the capital city of 1776 a hundred years after that date, and how it was celebrated, might have been better told in a larger book than this, parceled out among more writers than one. So extensive a subject, or collection of subjects, should be treated by specialists, and doubtless will be. But few readers will care to grapple with the library resulting from their labors. A sketch in popular style it was thought would meet a more immediate and general want than any to be satisfied by a bulky volume or series of volumes.

Where, however, there is so much to be referred to, described even superficially and commented on in the briefest way, compression becomes difficult. Themes are apt to crowd each other uncomfortably. The best efforts to avoid confusion and equitably to allot space and attention cannot entirely succeed, and this caveat will have to be borne in mind for use more than once in the perusal of the following pages. For the criticisms here and there made and opinions advanced less indulgence is asked. They must be taken for what they are worth. They will not all offend or satisfy everybody, and were not expected to reach that extreme of correctness or of incorrectness. The dryest note-book of a day's travel will contain something in the way of remark. Much more when the tour is through the achievements of a century and the exhibition designed to bring them before

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the eye. All that need be claimed is an endeavor not to be hasty, negligent or consciously partial in observation or remark.

A much longer period than six months would have been required for the thorough study of the Centennial display. But a far shorter one sufficed for the formation of sound and useful impressions. Well worth scrutiny with the microscope, it was still eloquent and instructive to the naked eye. He who ran, even, might read, if he ran often enough and on courses systematically laid out. The account here given and conclusions stated are the result of many visits definitely planned and memoranda made on the spot. For both note and comment, it should be added, the writer is solely responsible. In no instance has he taken at second hand description or conclusion.

PART I.

GENERAL PROGRESS.

THIS of ours is a conceited century. In intense self-consciousness it exceeds any of its late predecessors. Its activity in externally directed thought is accompanied by an almost corresponding use of introverted reflection. Its inheritance, and the additions it has made, can make or will make thereto, supply an ever-present theme. It delights to stand back from its work, like the painter from his easel, to scan the effect of each new touch—to note what has been done and to measure what remains. It is a great living and breathing entity, informed with the concrete life of three generations of mankind the most alert and the most restless of all that have existed. This sensation of exceptional endowments is self-nourishing and ever-growing; and our little nook of time is coming to view all the paths of the past, broad or narrow, direct or interlacing, straight or obscure, as so many roads laid out and graded for the one purpose of leading straight to its gate. It sounds its own praises and celebrates itself at all opportunities. But with all this there is a wholesome recognition of responsibility. Nobility obliges, it is prompt to confess, and to act accordingly. It sees flaws in its

regal diamonds, spots that still sully on its ermine, and is not slow to address itself to the duty of their removal.

If the century understands itself, it may be said likewise to understand the others better than they did themselves. It collects their respective autobiographies and their mutual criticisms. The real truths, half truths and delusions each has added to the accumulating common stock it sifts and weighs, mercilessly piling a dust-heap beyond Mr. Boffin's wildest dreams, and rescuing, on the other hand, from the old waste-basket many discarded scraps of real but till now unacknowledged value. Busy in gathering stores of its own, it is able to find time for digesting those bequeathed to it, and for executing both tasks with a good deal of care. It brings skepticism to its aid in both, and subjects new and old conclusions to almost equally close analysis. Each new pebble it picks up upon the shore of the Newtonian ocean it holds up square and askew to the light, and cross-examines color, texture and form. Now and then, being but mortal after all, it chuckles too hastily over a brilliant find, but the blunder is not apt to wait long for correction. Just now it appears to be overhauling its accounts in the item of science, taking stock of its discoveries in that field, balancing bad against good, and determining profit and loss. Some once-promising entries have to undergo a black mark, while a few claims that were despaired of come to the fore. This proceeding is only preparatory, however, to a new departure on a bolder scale. Scientific progress knows only partial checks. Its movement is that of a force *en échelon:* one line may get into trouble and recoil, while the others and the general front continue to advance. Theory does not profess to be certainty. It is only tentative, and subject necessarily to frequent errors, for the elimination of which the severely skeptical spirit of the laws to which it is now held furnishes the best appliance. Modern science possesses an internal *vis medicatrix* which prevents its suffering seriously from excesses or irregularities. When it ventures to touch the shield of the Unknowable, it is only with the butt of its lance, and the inevitable overthrow is accepted with the least modicum of humiliation.

In that science which assumes to marshal all the others, philosophic and judicial history, ours ought to be the foremost age, if only because it has the aid of all the others. It does more, however, than they can be said to have contemplated. It widens the scope of history, and more precisely formalizes its functions. It makes of the old chroniclers so many moral statisticians, fully utilizing at the same time their services as collectors of material facts. The deductions thus arrived at it aims to test by the methods of the exact sciences. It invites, in a certain degree, moral philosophy to don the trammels of mathematics and decorate its shadowy shoulders with the substantial yoke of the calculus. Such is the programme of a school too young as yet to have matured its shape, but full of vigor and confidence, and a very promising outgrowth from the elder and more stately academy of abstract historical inquiry and generalization. The latter has redeveloped and freshened up for us the pictures of the ancient story-tellers, and has furthermore had them, so to speak, engraved and scattered among the people, until we have come to live in the midst of their times and enjoy an intimate knowledge of the actual condition of human polity and intelligence at any given period. Through the long gallery or the thick portfolio thus presented to our eye we may trace the common thread of motive under the varying conditions of time and circumstance. This thread able hands are aiding us to discover.

To what segment of time shall we assign the name of Nineteenth Century? In A. D. 1800 there was dispute as to which was properly its first year, the question being settled in favor of 1801. Having thus struck out the first of the eighteen hundreds, we may take the liberty of similarly ostracizing the last twenty-four or twenty-five, which are yet to come, and start the nineteenth century as far back in the eighteenth. If we look farther behind us, the centuries will be

found often to overlap in this way. Coming events cast their shadows before, and the morning twilight of the new age is refracted deeply into the sky of the old one. Of no case can this be more truly said than of that in point. Not only America, but Christendom, may safely date the century's commencement about 1775 or 1776. The narrowest isthmus between the mains of past and present will cover those years.

England and France were then both at the outset of a new political era, sharply divided from that preceding. The amiable and decorous Louis XVI., with his lovely consort, had just ousted from Versailles the Du Barrys and the Maupeons. George III., a sovereign similar in youth and respectability of character, had a few years before in like manner improved the tone of the English court, and, after the first flush of welcome from his subjects, surprised and delighted to have an Englishman and a gentleman once more upon the throne, was getting over his early lessons in adversity from the birch of Wilkes and Junius, and entering upon a second series from that of Washington, all preparatory to the longest and most brilliant reign in British annals. Frederick II. was an old man, occupied with assuring to the power he had created the position it now holds as the first in Europe. Clive, in the House of Lords, was nursing a still younger bantling, now an empire twice as populous as Europe was at that period. Under the equally rugged hand of the young princess of Anhalt-Zerbst, Russia was having her Mongolian epidermis indued with the varnish Napoleon so signally failed to scrape off, and was for the first time taking a place among the great powers of the West. The curtain, in short, was in the act of rising on the Europe of to-day. Anson had lately brought the Pacific to light, and Cook was completing his work. The crust of Spanish monopoly in the trade of four-fifths of the North and South American coasts had been broken, and England was preparing to replace it, at some points, by her own. This was, of itself, a New World, geographical and commercial.

Under Linnæus and Buffon, another world, wider still, was unfolding its wonders and subjecting them to a classification which has since been but little changed, vast as have been the subsequent accessions of knowledge and attainments in methods of interpretation. Before them, the study of the organic creation can scarcely be said to have existed. The inorganic was as little reduced to system, and in its broadest aspect was not even looked at. Buffon's acute but for the most part empiric speculations on the structure of the globe were a step in advance; but the science of geology he did not recognize, and left to be shaped a very little later by Hutton. Priestley, Cavendish and Lavoisier were dissecting the impalpable air and making the gaseous form of substances as familiar and manageable as the solid. Hence true analytic chemistry. Astronomy, an older science, had derived new precision from the first observed transit of Venus, imperfect as were the data obtained and the calculations made.

Contemporaneous with this sudden apparition of new fields of scientific discovery and enlargement of the old was an intellectual movement of a more general character than that necessarily involved in the progress of natural philosophy. The French Encyclopædists took hold of social, moral and juridical questions with an unsparing vigor that could not be gainsaid. The art of criticism was simultaneously introduced, perfected and applied. Many of the wrongs and follies that paralyzed thought and industry were dragged to light. Hoary absurdities that smothered law and gospel under the foul mass of privilege and superstition, and made them a curse instead of a blessing, shrank before the storm of ridicule and denunciation. Those which did not at once succumb were placed in a position of publicity and exposure in which they could not long survive. The great upheaval of which the French Revolution was a part was thus originated.

Sounder political ideas were brought within reach of the masses, till then not recipient, it may almost be said, of anv

political ideas at all. Statesmen and governments were similarly enlightened. Adam Smith's declaration of commercial antedated by two years Mr. Jefferson's of political independence. The atrocities of the English criminal code, approaching those of Draco, were put in process of correction, though, as usual in British reforms, it took half a century to effect their complete removal; a woman having been, if we recollect rightly, hanged for a trifling theft in the last years of George IV. This same slowness of that conservative but persevering people is calculated to blind us to the operation among them of deep-seated and active influences. Hardly till 1815 can we discover in England any fervor, much less efficiency, in the demand for an extension of popular rights and relaxation of the grasp of privilege. Irish manufactures continued to be distinctly and rigidly repelled from competition with English by formal statute; Jewish and Catholic disqualification was maintained; the game-laws and the rotten-borough system, which conferred on the nobility and gentry arbitrary power over the purse and person of the commonalty, were determinedly upheld; counsel was only nominally allowed to the defendant in criminal cases; chancery withheld or plundered without resistance or appeal; and there can be no doubt that life and property were better protected by law in France at the fall of the First Napoleon than in Great Britain. Nevertheless, the movement had begun in the latter country forty years before. A generation had passed since the battle of Culloden, and the island was at length indissolubly and efficiently one. It shared fully in the intellectual impulse of the day. Victorious in all its latest struggles and freed from all sources of internal danger, it might naturally have been expected to enter at once on a career of improvement more marked than in the case of its neighbors. It is not easy to assign reasons for failure in this respect, unless we seek them in disgust at the subsequent dismemberment and disturbance of the empire by the fruits of popular agitations in America, Ireland and France. The reaction due to such causes was probably sufficient to defeat all liberal efforts. The leading English writers of the Revolutionary period were strong Tories. Such were Johnson, the Lake poets after their brief swing to the opposite extreme, and Scott. All these except the first belong as well to the time of successful reform, and Johnson may be claimed by the eighteenth century; which serves to illustrate the blight cast upon British literature by the prolonged resistance of British statesmen to the prevailing current—a resistance which took its keynote from the dying recantation and protest of the Whig Chatham.

The opening of the epoch, then, was as marked in Great Britain as elsewhere. Only in special fields she afterward fell behind, and lost something like half the century. In others she kept abreast, or even in advance.

Criticism was not content to exercise its new powers and apply its newly-framed laws exclusively in the investigation of any branch of philosophy. It brought them to bear upon the arts. The discovery of the buried cities of Campania aided in attracting renewed attention to the art-stores of Italy, ancient and modern. The principles of taste and beauty which they illustrated were searchingly analyzed and carefully explained. Painting and sculpture began slowly to emit their rays through the eclipse of more than a century. The allied art shared in this second and secondary renaissance. Haydn was in full fruit, Mozart ripening, and Music watched, in the cradle of Beethoven, her budding Shakespeare. A fourth Teuton was studying the symphonies of the spheres; and within the first five years of the century, while the "crowning mercy" of Yorktown was maturing, a planet that had never before dawned on the eye of man took its place with the ancient six, and "swam into the ken" of Herschel.

We have said enough to vindicate our assumed chronology and justify our readjustment of the calendar. Europe may well be invited to celebrate her own political, social and material centennial in 1876, as truly as that of America. Her

intellectual revival indisputably contributed, through Franklin, Laurens, the Lees and others who were immediately within its influence, to bring on the American movement; and her thought, in turn, has since that juncture as certainly gravitated, in many of its chief manifestations, toward that of the New World. Hers is the jubilee not less than ours. The humblest cot on her broad bosom is the brighter for '76. By no means the least fortunate of the beneficiaries is Great Britain herself. Contrast her present position as a government and a society with what it was when Liberty Bell announced the dismemberment of her empire. Her rank among the nations has notably improved. The population of England, Scotland and Wales was then estimated below eight and a half millions—a numerical approximation, by the way, to the three millions of the colonies not sufficiently considered when we measure the stoutness of her struggle against them with France and Holland combined. Of the continental powers, the French numbered perhaps twenty-two millions, Spain twelve, the Low Countries six, Germany thirty, Prussia seven, and so on. From the ratio of one to nearly three, as compared with France, Britain has, if we include pacified and assimilated Ireland—an element now of strength instead of weakness—advanced to an equality. She has equally gained on the others, except Prussia, with its aggregation of new provinces. She may, furthermore, in the event of an internecine conflict with a combination, count upon the unwillingness of America to see her annihilated; not the least just of Tallyrand's observations expressing his conviction that, though the two great Anglo-Saxon powers might quarrel with each other, they would not push such a dispute for the benefit of a third party. But, dismissing the question of mere brute strength, Britain's sentiment of pride is conciliated by the spectacle of an advance in the numbers speaking her tongue from eleven or twelve to eighty millions within the century, and that in considerable part at the expense of other languages; millions of foreign immigrants, parents or children, having abandoned their vernacular in favor of hers.

Let us now essay a light sketch of the stream at whose source we have glanced. Superficial it must be, for to attempt more were to confront the vast and many-sided theme of modern civilization. The nineteenth century, the child of history, has the stature of its progenitor. The record of its activity would fill more libraries. Conditions, forces, results,—all have been multiplied. But a few centuries ago the world, as known and studied, was a corner of the Levant, with its slender and simple apparatus of life, social, political and industrial. Later, its boundaries were extended over the remaining shores of the same landlocked sea. Again a step, but not an expansion, and it looked helplessly west upon the Atlantic; its ancient domain of the East almost forgotten. Then that long gaze was gratified, and Cathay was seen. With that came actual expansion, which continued in both directions of the globe's circuit until now. At length the world of thought, of inquiry and of common interest is becoming coincident with the sphere.

In the direction of international politics progress during the century has not kept pace with the advance in other walks. We are accustomed to speak of Europe as forming a republic of nations, but that cannot be said with much more truth than it could have been in the middle of the sixteenth century. A sense of the value to the peace of the continent of a balance of power was then recognized; and the object was attained in some measure as soon as the career of Charles V., which had inculcated the lesson, admitted at his abdication of an application of it. Treaties were then framed, as they have been constantly since, for this purpose, and the observation of them was perhaps as faithful. The passions of nations, like those of men, furnish reason with its slowest and latest conquests. The great wars of the French Revolution, and the short and sharp ones which have, after an indispensable breathing-spell, recently followed it, were as causeless and as defiant of the compacts designed to prevent them as those of the

Reformation period or of the Thirty Years. They were so many confessions that an efficient international code is one of the inventions for which we must look to the future. It is something, meanwhile, that, with the extinction of feudalism and the concretion of the detached provinces with which it had macadamized Christendom, the ceaseless fusillade of little wars, which played like a lambent flame of mephitic gas over the surface of each country, has come to an end. The petty sovereignties which made up Germany, France and Italy have been within a few generations absorbed into three masses —so many police districts which have proved tolerably effective in keeping the peace within the large territories they cover. The nations, thus massing themselves for exterior defence, and maintaining a healthy system of graduated and distributed powers, original or conferred, for the support of domestic order and activity, have cultivated successfully the field of home politics.

In that the change for the better is certainly vast. It is difficult for Americans, whose acquaintance with European history is usually derived from compends, to realize what an incubus of complicated and conflicting privileges, restrictions and forms has, within the century, been lifted from the energies of the Old World. The sweeping reforms in French law are but a small part of what has been done. All the neighbors of France, from Derry to the Dardanelles, have shared in the blessing. We may be assisted to an idea of it by turning to the experience of our own country, whose condition in this regard was so exceptionally good at the beginning of the period in point. The constitutions of our States have been repeatedly altered, and they are now very different in their details from the old colonial charters, liberal and elastic as these for the most part were. Yet American innovations are but child's play to those of Europe, which has not reached the position we held at the beginning, and has a great deal still to do. In France the people are not trained to local self-government, but they have an excellent police, and the rights of person and property are well protected. In Italy, which has only within a few years ceased to be a mere geographical expression, municipal rights and the independence of the commune are on a stronger basis, but the police is bad, though far better than when the Peninsula was divided among half a dozen powers. Both have but commenced arming themselves with the chief safeguard of Germany, popular education. The great fact with them all is, that, despite the drawbacks of external pressure and large standing armies, they are at liberty to pursue the path of domestic reform as far as they have light enough to perceive it or purpose enough to require it.

All this is an immense gain. It reflects itself in the improved social condition of the people—a result, of course, not wholly due to it. Crime, though the newspapers make us familiar with more of it than formerly, has notably diminished. The savage classes of the great capitals, populous as some of the old kingdoms, are controlled like a menagerie by its keepers. A residuum of the untamable will always exist, inaccessible to education or "moral suasion," and amenable only to force. This force seems sufficiently supplied by the baton of the constable, and we may hope that even in volcanic Paris an eruption of barricades will henceforth cease, unless simply as a somewhat flamboyant expression of political sentiment, the gamin throwing up paving-stones and omnibuses as the independent British voter throws up his hat at the hustings. But it will not do to expect too much from any ameliorating cause or chain of causes. Race-characteristics cannot be annihilated. Man is an animal, and the Parisian turbulent. The Commune has done its worst probably, and the Internationale, which threatened at one time to loom up as a modern Vehmgericht, has subsided. Whatever may hereafter come of such slumbering perils, the beneficent forces which so largely repress and reduce them are none the less real.

The marked advance of the masses in physical well-being is a great—some would say the greatest—item in social

profit and loss. Food is everywhere better in quality and more regular in supply. The English record of the corn-market for six centuries shows a remarkable alteration in favor of steadiness in price. The uncertainties of the seasons are discounted or neutralized by the average struck by increased variety of products and multiplied sources of supply. Famines become infrequent. That of 1847 in Ireland, bad as it was, would have been worse a hundred years earlier. A given population is more regularly and better fed than one-fifth of its number would at that time have been. A city of four millions would then have been an impossibility. Dress and lodging are better, and relatively cheaper. Hygiene is more understood, imperfect as is its application. Some diseases due to its disregard have disappeared or been localized. As a result, men have gained in weight and size and in length of life.

In the character of their recreations—a thing largely governed by national idiosyncrasy — the masses have advanced. And this we may say without losing sight of the devastations of intemperance since the distillation of grain was introduced, about a century and a half ago. With an enhanced demand upon man's faculties civilization brings an increased use of stimulants. There are many of these unknown to former generations. In noting those which attack the health by storm we are apt to overlook others which proceed more stealthily by sap. Of these are coffee, tea, chocolate, the rich spices and more substantial accessions to the modern table, all stimulating and inviting to excess, but all, as truly, nutritious and apt to take the place of other aliment, thus adapting the measure of their use, as a rule, to the demands of the system. The consumption of opium, the one dissipation of the Chinese till now unadded to the three or four of the Caucasian, is said to be extending. If so, a *Counterblast* to it from king or commonwealth will be as ineffectual as against its allied narcotic. Prohibitory laws will be even more unavailing than in the case of ardent spirits. It will run its course — a short one, we trust—and be followed or joined by new drugs contributed by conscienceless trade.

Intemperance—we use the word in its special but most common signification—is debasing. Compensation, so far as it goes, is found in the abandonment by those communities among whom it is most rife of certain gross amusements, such as cock-fighting and the prize-ring. Bull- and bear-baiting, too, so prominent among the *delicia* of England's maiden queen, have died out. Isolated Spain, fenced off by the Pyrenees from the breeze of benevolence wafted from the virtuous and bibulous North, still utilizes the Manchegan or Estremaduran bull as a means of conferring "happy despatch" on her superannuated horses and absorbing the surplus belligerence of her "roughs." She seems, however, disposed to tire of this feast of equine and taurine blood, and the last relic of the arena will before many years follow its cognate brutalities. For obvious reasons, bull-fighting can be the sport, habitually, of but an infinitesimal fraction of the Spaniards. They share with the other races of the Continent the simple pleasures of dance and song. These enjoyments, as we go north and are driven within doors from the pure and temperate air by a more unfriendly climate, form an increasingly intimate alliance with strong drink, until in the so-called gardens of Germany Calliope and Gambrinus are inseparable friends. Farther still toward the Pole the voice of the Muse gradually dies away upon the sodden atmosphere; and she, having outlasted her successive Southern associates, wine and beer, in turn gives place to brandy pure and simple—a beverage itself frost-proof and only suited to frost-proof men.

The long nights and indoor days of the North are favorable to another and more desirable trait of modern social progress —education. The potency of such a meteorological cause in making popular a taste for knowledge the instances of Iceland, Scotland, Scandinavia and North Germany, to say nothing of New England, leave us no room to doubt. It is, of course, not the only cause. Ability to read and write is as universal in China

and Japan as in the countries we have named. In the case of the Orientals it cannot be ascribed, either, wholly to that conviction of the importance, as a conservative guarantee, of elevating the popular mind and taste, which belongs to the enlightenment of the day. Instinctive recognition of this need manifests itself in a simultaneous move in the direction of universal education at government expense throughout the two continents. All the populations snatch up their satchels and hurry to school. Athens revives the Academe and reinstates the Olympic games under a literary avatar. Italy follows suit. Hornbooks open and shut with a suggestive snap under the pope's nose, and Young Rome calculates its future with slate and pencil. Gaul, fresh from one year's term in the severest of all schools, adversity, joins the procession, close by John Bull, who, *more suo*, pauses first to decide whether the youthful mind shall take its pap with the spoon of orthodoxy or heterodoxy, or neither. With him the question between Church schools and national schools is complicated by one which is common to other nations—whether attendance shall be compulsory or voluntary only. The tendency is toward the former, which has long been in practice in some of the States of the Union; and it seems not unlikely that Christendom will, before many years, revert, in this important matter, to the Spartan view that children are the property of the state.

Lavish beyond precedent are the provisions made by governments and individuals everywhere for the promotion of this great object. Private endowment of schools and colleges was never before so frequent and liberal, and nothing so quickly disarms the caution of the average taxpayer as an appeal for common schools. From California eastward to Japan it is honored along the whole line, the unanimous "Yea" being the most eloquent and hopeful word the modern world emits. Of the slumbering power that till recently lay hidden in coal and water, and which has so incalculably multiplied the material strength of man, much has been said; but we fail to appreciate the unevoked fund of intellect upon which he has additionally to draw. The highest expectation of results to be witnessed and enjoyed by the approaching generations involves no postulate of human perfectibility. It finds ample warrant in what has been accomplished under our eyes. A century ago only Scotland and two or three of the American colonies could be said to possess a system of common schools. From those feeble and smouldering sparks what a flame has spread! The space it has covered and the fructifying light and warmth it has produced may in some measure be gauged by the newspaper press and the vast bulk of popularized information in book-form created since then. This shows the increase in the numerical ratio of readers to the aggregate of population.

A difficulty exists in the provision of officers for this great army of pupils. They cannot always be raised from the ranks. The thoroughness of a teacher's knowledge is not acquired by the requisite proportion. Normal schools demand more and more attention. But here we arrive at a field of detail that would lead us far beyond the limit of these pages. We pass naturally from the subject of education to what is, in the narrower but most generally accepted sense of the word—mental training—its leading object of pursuit.

If, in the broader and truer meaning of education—that which assumes the impalpable part of man to be something more than a sponge for facts—the slender phalanx of *the men who know* will ever remain, proportionally, a small band, it is at least certain that in acquaintance with natural phenomena and their relations the masses of the nineteenth century stand out from their forefathers as eminent philosophers. Our age may be almost said to have created rather than extended science, so mighty is the bulk of what it has added by the side of what it found.

In mathematics, the branch which most nearly approaches pure reason, least advance has been made. There was least room for it. Newton, when, at quite a

mature period of his career, Euclid was first brought to his attention, laid the book down after a cursory glance with the remark that it was only fit for children, its propositions being self-evident. Yet to those truisms Newton added very little. His work lay in their development and application. Laplace and Biot belong to our own day; but their task, too, consisted in the employment of old rules and the most effective tools of the mathematician, the Arab algebra and Napier's logarithms. The science itself without application is, like logic, a soul without a body.

The field most fruitful under its application is that of astronomy. Here, progress has been great. A measuring-rod has been provided for the depths of space by the ascertainment of the sun's distance from the earth within one in three hundred of probable error. The existence of a cosmic ether, a resisting medium, has been established, and its retarding influence calculated. Many of the nebulæ have been reduced, and others proved to be in a gaseous condition, like comets. The latter bodies have been chained down to regular orbits, followed far beyond those of the old planets, and brought into genealogical relations with these through the links of bolides and asteroids. The family circle of planets proper has been immensely increased, a new visitant to the central fire appearing every few years or even months. Newton connected the most distant points of the universe by the one principle of gravitation: the spectroscope unites them by identity of structure and composition. Improved instruments have detected the parallax of a number of the fixed stars, and traced motion in both solar and stellar systems as units. Coming homeward from the distant heavens, the advances of astronomy diminish as we near what may be called the old planets and our pale companion the moon. The existence of a lunar atmosphere and the habitability of Mars, for example, are still debated, with very fluctuating odds. But the star-gazers make their craft useful in a novel way when it reaches the earth. Upon the precession of the equinoxes they erect a fabric of retrograde chronology, and set a clock to geologic time. Here Sir Isaac is brought to grief. His excursions beyond the Deluge are discredited as guides. He misleads us among the ages as sadly as Archbishop Usher. The profoundest of laymen and the most learned of clerics were equally at sea in locating creation. That successive phases of animate existence were rising and fading with the oscillations of the earth's inclination to its orbit never occurred to him to whom "all was light." To probe the stars was to him a simpler process than to anatomize the globe upon which he stood.

This is the less remarkable when we reflect what a hard fight geology has had. A generation after Newton's death fossils were referred for their origin to a certain "plastic power" in Nature—mere idle whittlings of bone that had never known an outfit of flesh and blood. Then came a long and motley procession of cosmogonies, every speculator, from John Wesley down to Pye Smith, insisting warmly on what seemed good in his own eyes. The last stand was made on the antiquity of man, and it is only a dozen years since the ablest of British—perhaps since Cuvier of modern—geologists, Sir Charles Lyell, yielded to the preponderance of evidence, and confessed that the era of man's appearance on earth had been made too recent. A few determined dogmatists still linger behind the line of retreat, like Ney at the bridge of Kowno, and fire some fruitless shots at the advancing enemy. This is well. Tribulation and opposition are good for any creed, scientific or other. It weeds out the weak ones and strengthens those that are to stand.

The mapping out of extinct faunas and floras and assigning pedigree to existing species are by no means the whole province of geologists. Productive industry owes to them a vast saving of time and cost in searching for useful minerals. They distinguish the same strata in widely separated districts by means of the characteristic fossils, and are thus enabled to guide the miner. A geological survey of its territory is one of the first cares of an enlightened government, and

a geologist is the one scientific official the leading States of the Union agree in maintaining. The science has moved forward steadily from its original office of studying buried deposits and classifying extinct organisms, until the hard and fast line between fossil and recent has disappeared, the continuous action of ordinary causes in past and present been established, and an unbroken domain assigned to the laws of the visible creation. Deep-sea soundings have extended inquiry, slight enough as yet, to that immensely preponderant portion of the globe's crust that is covered by water. Penetrating the ocean is like penetrating the rocks, inasmuch as it introduces us to some of the same primal forms of life; but it presents them in an active and sentient state. Neptune's ravished secrets vindicate the Neptunists, while Pluto is relegated to the abode assigned him by classic myths, where he and his comrade, Vulcan, keep their furnaces alight and project their slag and smoke through many a roaring chimney.

Upon (as beneath) the deep, science is erecting for itself new homes. It tracks the wandering wind, and moves at ease, calmly as a surveyor with chain and compass, through the eddies of the cyclone. It maps for the sailor the currents, aërial and subaqueous, of each spot on the unmarked main, and sends him warning far ahead of the tempest. It divides with the thermometer the mass of brine into horizontal zones, and assigns to each its special population.

A hundred years ago, only the surface of the land was studied, and but a small part of that. All beneath its surface was a mystery, and the lore of the sea was untouched. Now, knowledge has penetrated to the central fire, and of the sea it can be no longer said that man's "control stops with its shores." The pathway of his messenger from continent to continent he has laid deep in its chalky ooze, while over it silt silently, flake by flake, as they have been falling since æons before his creation, the induviæ of the earliest creatures.

And this his messenger at the bottom of the sea is back in its old home. First hidden in the electron cast up by the waves of the Baltic, it was left there, uncomprehended and barren, till our century. During all that time it was calling from the clouds to man's dazzled eye and deafened ear. It pervaded the air he breathed, the ground he trod and the frame which constituted him. It bore his will from brain to hand, and guarded his life, through the (so-called) spontaneously acting muscles of the thorax, during the half or third of that life during which his will slumbered. At length its call was hearkened to intelligently. Franklin made it articulate. Its twin Champollions came in Volta and Galvani. Its few first translated words have, under a host of elucidators, swelled to volumes. They link into one language the dialects of light, motion and heat. The indurated turpentine of the Pomeranian beach speaks the tongue of the farthest star.

The sciences, like the nations and like bees, as they grow too large for their hive are perpetually swarming and colonizing. Not that colonization is followed, as in the case of the similitude, by independence. Their mutual bonds become closer and closer. But convenience and (so to speak) comfort require the nominal separation. So electricity sets up for itself; and chemistry, the metropolis, swells into other offshoots. So numerous and so great are these that the old alchemists, unlimited range through the material, immaterial and supernatural as they claimed for their art, would rub their eyes, bleared over blowpipe and alembic, at sight of its present riches. The half-hewn block handed down by these worthies—not by any means

> Like that great Dawn which bafiled Angelo
> Left shapeless, grander for its mystery,

but blurred and scratched all over with childish and unmeaning scrawls — has been wholly transformed. Chemistry no longer assumes to read our future, but it does a great deal to brighten our present. Laboring to supply the wants and enhance the pleasures and security of daily life, it makes excursions with a sure foot in the opposite direction of abstruse prob

lems in natural philosophy. It analyzes all substances, determines their relations, and tries to guide the artisan in utilizing its acquisitions for the general good. To enumerate these, or to give the merest sketch of chemical progress within the century, would fill many pages. It has enriched and invigorated all the arts by supplying new material and new processes. Illuminating gas, photography, the anæsthetics, the artificial fertilizers, quinine, etc. are a few of its more familiarly known contributions. It has aided medical jurisprudence, and so far checked crime. Besides enlarging the pharmacopœia, it has promoted sanitary reform in many ways, notably by ascertaining the media of contagion in disease and providing for their detection and removal. Its triumphs are so closely interwoven with the appliances of common life that we are prone to lose sight of them. From the aniline dye that beautifies a picture or a dress, to the explosive that lifts a reef or mines the Alps for a highway, the gradations are infinite and multiform.

Heavy as is the draft of the material sciences upon the thought and energy of the century, it has not monopolized them. No trifling resources have been left for mere abstract investigation. If metaphysics stands, despite the labors of Stewart, Hamilton, Hegel, Comte, very much where it did when Socrates ran amuck among the casuistical Quixotes of his day, and left the philosophic tilters of Greece, the knights-errant in search of the supreme good, in the same plight with the chivalry of Spain after Cervantes, the science of mind, and particularly mental pathology, has made some steps forward on crutches furnished by the medical profession. The treatment of insanity is on a more rational and efficient footing. The statistician collects, and invites the moral philosopher to collate, the records of crime. The naturalist studies the life of the lower animals, and gives the *coup de grace* to the uncompromising distinction drawn by human conceit between instinct and intelligence.

In the walks of comparative philology much has been accomplished. Sanskrit has been exhumed. Aryan and Semitic roots are traced back to an almost synchronous antiquity. The decipherment of the Egyptian inscriptions seems to bring us into communication with a still more remote form of language. More recent periods derive new light from the Etruscan tombs and the Assyrian bricks. Linguists deem themselves in sight of something better than the "bow-wow" theory, and are no longer content to let the calf, the lamb and the child bleat in one and the same vocabulary of labials, and with no other rudiments than "ma" and "pa" "speed the soft intercourse from pole to pole." As yet, however, that part of mankind which knows not its right hand from its left is the only one possessed of a worldwide lingo. The flux that is to weld all tongues into one, and produce a common language like a common unit of weight, measure and coinage, remains to be discovered. A Chinese pig, transplanted to an Anglo-Saxon stye, has no difficulty in instituting immediate converse with his new friend, but the gentleman who travels in Europe needs to carry an assortment of dialects for use on opposite sides of the same rivulet or the same hill. However, as the French franc has been adopted by four other nations, and the French litre and mètre by a greater number, one and the same mail and postage made to serve Europe and America, and passports been abolished, we may venture to picture to ourselves the time when the German shall consent to clear his throat, the Frenchman his nose, the Spaniard his tonsils and the Englishman the tip of his tongue—when all shall become as little children and be mutually comprehensible. Commerce at present is doing more than the philosophers to that end. While the countrymen of Wilhelm von Humboldt and Max Müller persist in burying their laboriously heaped treasures under a load of black-letter type and words and sentences the most fearfully and wonderfully made, the skipper scatters English words with English calico and American clocks among all the isles. A picturesque fringe of pigeon English decorates the coasts of Africa, Asia and Oceanica. It might be

deeper, and doubtless will be, for our mother-tongue will very certainly be supreme in the world of trade for at least a couple of centuries to come. If we were only half as sure of its being adopted by France as by Fiji!

If almighty steam and sail must remain unequal to this task, wondrous indeed are their other potencies. They have contracted the globe for the traveler into a fourth or sixth of its former bulk. In 1776 three years was the usual allotment of the grand tour. Beginning at London, it extended to Naples and occasionally Madrid. It often left out Vienna, and more frequently Berlin. In the same period you may now put a girdle round the earth ninefold thick. You may, given the means and the faculties, set up business establishments at San Francisco, Yokohama, Shanghai, Canton, Calcutta, Bombay, Alexandria, Rome, Paris, London and New York, and visit each once a quarter. The goods to supply them may travel, however bulky, on the same ship and nearly the same train in point of speed with yourself. Nowhere farther than a few weeks from home in person, nowhere are you more remote verbally than a few hours. The Red Sea opens to your footsteps, as it did to those of Moses; and the lightning that bears your words cleaves the pathway of Alexander and the New World for which he wept.

It is really hard to mention these innovations on the old ways, so vast and so sudden, without degenerating into rhetoric or bombast. The spread-eagle style comes naturally to an epoch that soars on quick new wing above all the others. We have it in all shapes—equally startling and true in figures of arithmetic or figures of speech. Any schoolboy can tell you, if you give him the dimensions of the Great Pyramid and state thirty-three thousand pounds one foot high in a minute as the conventional horse-power, how many hours it would take a pony-team picked out of the hundreds of thousands of steam-engines on the two continents to raise it. He will reduce to the same prosaic but eloquent form a number of like problems illustrative of the command obtained over some of the forces of Nature, and their employment in multiplying and economizing manual strength and dexterity and stimulating ingenuity. When we come to contemplate the whole edifice of modern production, it seems to simplify itself into one new motor applied to the old mechanical powers, which may perhaps in turn be condensed into one—the inclined plane. This helps to the impression that the structure is not only sure to be enlarged, as we see it enlarging day by day, but to grow into novel and more striking aspects. Additional motors will probably be discovered, or some we already possess in embryo may be developed into greater availability. These, operating on an ever-growing stock of material, will convince our era that it is but introductory to a more magnificent and not far distant future.

Magnificent the century is justified in styling its work. What matter could do for mind and steam for the hand it has done. But is there any gain in the eye and intellect which perceive, and the hand which fixes, beauty and truth? Is there any addition to the simple lines, as few and rudimental as the mechanical powers, which embody proportion and harmony, or in the fibres of emotion, as scant but as infinite in their range of tone as the strings of the primeval harp, which ask and respond to no motor but the touch of genius? Have we surpassed the old song, the old story, the old picture, the old temple?

Such questions must be answered in the negative. The age, recognizing perforce the inherent capabilities of the race as a constant quantity, contents itself so far with endeavoring to adapt and reproduce, or at most imitate, such manifestations of the artistic sense as it finds excellent in the past. The day for originality may come ere long, and nothing can be lost in striving for it, but a capacity for the beautiful at first hand cannot come without an appreciation of it at second hand. With the number of cultivated minds so vastly increased as compared with any previous period, the greater variety of objects and conditions presented to them, the multiplicity of races

to which they belong, and consequently of distinct race-characteristics imbedded in them and brought into play, and the impulse communicated by greater general activity, the expectation is allowably sanguine that the nineteenth century will plant an art as well as an industry of its own. Wealth, culture and peace seldom fail to win this final crown. They are busily gathering together the jewels of the past, endless in diversity of charm. Museum, gallery, library swell as never before. The earth is not mined for iron and coal alone. Statue, vase and gem are disentombed. Pictures are rescued from the grime of years and neglect. All are copied by sun or hand, and sent in more or less elaboration into hall or cottage. In literature our possessions could scarce be more complete, and they are even more universally distributed. The nations compete with each other in adding to this equipment for a new revival, which seems, on the surface, to have more in its favor than had that of the cinque-cento.

PART II.

AMERICAN PROGRESS.

POST-OFFICE DEPARTMENT BUILDING AT WASHINGTON.

FROM showing the world's right to the epoch of '76, and sketching the progress of the century in its wider aspect, a natural transition is to the part played in illustrating the period by the people from whose political birth it dates, and who have made the task of honoring it their own. They have reached their first resting-place, and pardonably enjoy the opportunity of looking back at the road they have traversed. They pause to contemplate its gloomy beginning, the perilous precipices along which it wound, and the sudden quagmires that often interrupted it, all now softened by distance and by the consciousness of success. Opening with a forest-path, it has broadened and brightened into a highway of nations.

So numerous and various were the in-

fluences, formative and impellent, which combined to bring the colonies up to the precise ripening-point of their independence, as to make it difficult to assign each its proper force. In the concentric mass, however, they stand out sharp and clear, and the conjoint effect seems preordained. That the event should have come when it did, and not before or after, is as obvious as any of history's predictions after the fact. Looking through the glasses of to-day, we find it hard to realize that the Continental Congress renewed its expressions of loyalty to the king three weeks after the battle of Bunker Hill, so distinct before us rises the completed and symmetrical edifice of separation ready for its capstone, from its foundations growing steadily through the past.

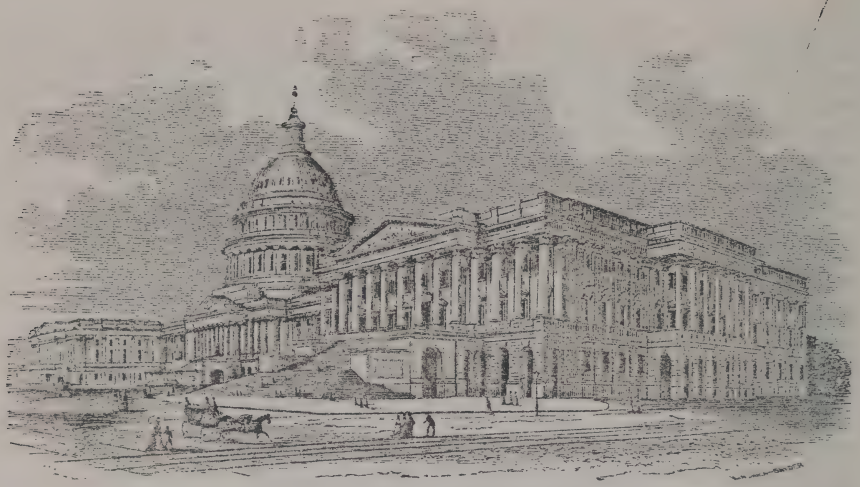
Thirteen years—from 1763 to 1776—were occupied in the topping-off. The Seven Years' War, that created the new central power of modern Europe, had a great deal to do with creating the new American power. It taught the colonies their strength, gave them several thousand native soldiers, and sent them from over the water the material, some of it completely wrought, for more in the German immigration consequent upon it. Out of it grew the obnoxious enactments that brought on the end. So closely simultaneous were these with the king's proclamation of October 7, 1763, prohibiting all his subjects "from making any purchases or settlements whatever, or taking possession of any of the lands, beyond the sources of any of the rivers which fall into the Atlantic Ocean from the west or north-west," as to support the suspicion that the British ministry had a premonitory sense of the coming struggle, and meant to prepare for it by checking the expansion of the colonies. The pressure applied to front and rear was part of one and the same movement; and is incompatible with the accepted view that neither cabinet nor Parliament anticipated, in the first instance, any American opposition to the Stamp Act and the system of legislation to which it was the opening wedge. The England of that day proposed to rule America after much the same fashion with Ireland, the Alleghanies presenting themselves very conveniently for an Indian Pale. This line of policy was in harmony with the ideas then predominant in England, and was fully understood by the colonists. They could not possibly have been blind to it, in view of the continuous and repeated claims of absolute legislative supremacy formally put forth, from the bill to that effect passed coincidently with the repeal of the Stamp Act down to the alterations made in the Massachusetts charter in 1774; the latter proceeding being in close harmony, both in time and motive, with the extension of the province of Quebec to the Ohio—one of the very rare evidences of sagacity and foresight discernible in the course of the ministry; for, while it did not avail to dam the westward flood, it certainly contributed, with other concessions made at the same time to the Canadians, to save the St. Lawrence to the Crown.

As apropos to this point, we transcribe from the original manuscript, written in the round, clear, unhesitating but steady hand characteristic of all Washington's letters, the following to James Wood of Winchester, afterward governor of Virginia, but then little more than a stripling:

"MOUNT VERNON, Feb'y 20th, 1774.

"DEAR SIR: I have to thank you, for your obliging acc^{t} of your trip down the Mississippi, contained in a Letter of the 18th of Octob^{r} from Winchester—the other Letter, therein refer^{d} to, I have never yet receiv^{d}, nor did this come to hand till some time in November, as I was returning from Williamsburg.

"The contradictory acc^{ts} given of the Lands upon the Mississippi are really astonishing—some speak of the Country as a terrestrial Paradise, whilst others represent it as scarce fit for anything but Slaves and Brutes. I am well satisfied, however, from your description of it, that I have no cause to regret my disappointment:—The acc^{t} of Lord Hillsborough's sentiments of the Proclamation of 1763, I can view in no other light than as one, among many other proofs,



THE CAPITOL AT WASHINGTON AND CARPENTERS' HALL, WHERE THE FIRST COLONIAL CONGRESS MET.

of his Lordship's malignant disposition towards us poor Americans, formed equally in malice, absurdity, and error; as it would have puzzled this noble Peer, I am persuaded, to have assigned any plausible reason in support of this opinion.

"As I do not know but I may shortly see you in Frederick, and assuredly shall before the Assembly, I shall add no more than that, it will always give me pleasure to see you at this place whenever it is convenient to you, and that with compliments to your good Mother I remain, Dr Sir, Yr most Obedt Hble Servt,

"Go Washington."

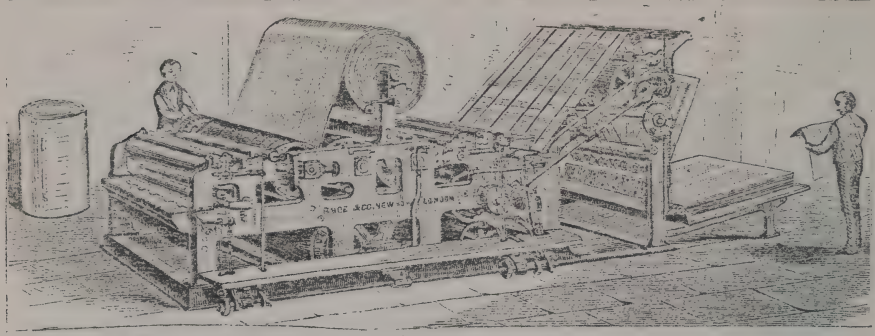
This private note, discussing casually and curtly the great river of the West, and the minister who endeavored to make it a *flumen clausum* to the colonists, nearly equidistant in date between the Boston Tea-party and the meeting of the Assembly which called the first Continental Congress, has some public interest. The West always possessed a peculiar attraction for Washington. He explored it personally and through others, and lost no occasion of procuring detailed information in regard to its capabilities. He acquired large bodies of land along the Ohio at different points, from its affluents at the foot of the Alleghany to the Great Kanawha and below. Now we see him gazing farther, over the yet unreddened battle-grounds of Boone and Lewis, to the magnificent province France and Spain were carefully holding in joint trusteeship for the infant state he was to nurse. The representative in the provincial legislature of a frontier county stretching from the Potomac to the Ohio, we may fancy him inspired, as he looked around from his post on the vertebral range of the continent, with "something of prophetic strain." If so, he was not long to have leisure for indulging it. Within eighteen months his life's work was to summon him eastward to the seashore. The Dark and Bloody Ground must wait. For its tillage other guess implements than the plough were pre-

paring—the same that beckoned him to Cambridge and the new century.

The slender driblet of population which at this juncture flowed toward the Lower Mississippi was due to the anxiety of Spain to get a home-supply of wheat, hemp and such-like indispensables from the temperate zone for her broad tropical empire. A newspaper of August 20, 1773, gives news from New York of the arrival at that port of "the sloop Mississippi, Capt. Goodrich, with the Connecticut Military Adventurers from the Mississippi, but last from Pensacola, the 16th inst." They had "laid out twenty-three townships at the Natchez," where lands were in process of rapid occupation, the arrivals numbering "above four hundred families within six weeks, down the Ohio from Virginia and the Carolinas." The Connecticut men doubtless came back prepared, a little later, to vindicate their martial cognomen; and to aid them in that they were met by Transatlantic recruits in unusual force. The same journal mentions the arrival at Philadelphia of 1050 passengers in two ships from Londonderry; this valuable infusion of Scotch-Irish brawn, moral, mental and muscular, being farther supplemented by three hundred passengers and servants in the ship Walworth from the same port for South Carolina. The cash value to the country of immigrants was ascertainable by a much less circuitous computation then than now; many of them being indentured for a term of years at an annual rate that left a very fair sum for interest and sinking fund on the one thousand dollars it is the practice of our political economist of to-day to clap on each head that files into Castle Garden. The German came with the Celt in almost equal force—enough to more than balance their countrymen under Donop, Riedesel and Knyphausen. The attention drawn to the colonies by the ministerial aggressions thus contributed to strengthen them for the contest.

But with all these accessions in the nick of time, two millions and a quarter of whites was a meagre outfit for stocking a virgin farm of fifteen hundred miles square, to say nothing of its future police and external defence against the wolves of the deep. It barely equaled the original population, between the two oceans, of nomadic Indians, who were, by general consent, too few to be counted or treated as owners of the land. It fell far short of the numbers that had constituted, two centuries earlier, the European republic from which our federation borrowed its name. The task, too, of the occidental United States was double. Instead of being condensed into a small, wealthy and defensible territory, they had at once to win their independence from a maritime power stronger than Spain, and to redeem from utter crudeness and turn into food, clothing and the then recognized appliances of civilized life the wilderness thus secured. Their ultimate triumph could not be doubted; but that the struggle, in war and in peace, must be slow and wearing, was quite as certain. It is dreary to look back upon its commencement now, and upon the earlier decades of its progress; and we cannot wonder that those who had it to look forward to half shrank from it. Among them there may have been a handful who could scan the unshaped wilderness as the sculptor does his block, and body forth in imagination the glory hidden within. That which these may have faintly imagined stands before us palpable if not yet perfected, the amorphous veil of the shapely figure hewn away, and the long toil of drill and chisel only in too much danger of being forgotten.

Population, the most convenient gauge of national strength and progress, is far from being a universally reliable one. We shall find sometimes as wide a difference between two given millions as between two given individuals. Either may grow without doing much else. They may direct their energies to different fields. Compared with the United States, France and Germany, for example, have advanced but little in population. They have, however, done wonders for themselves and the world by activities which we have, in comparison, neglected. The old city of London gains in wealth as it loses in inhabitants.



HOE'S NEW PERFECTING PRINTING-PRESS, PRINTING 12,000 DOUBLE IMPRESSIONS PER HOUR, AND THE OLD EPHRATA PRESS.

Yet success in the multiplication of souls within their own borders—depopulate as they may elsewhere—is eagerly coveted and regularly measured by all the nations. Since 1790, when we set them the example, they have one by one adopted the rule of numbering heads every five, six or ten years, recognizing latterly as well, more and more, the importance of numbering other things, until men, women and children have come to be embedded in a medley of steam-engines, pigs, newspapers, schools, churches and bolts of calico. For twenty centuries this taking of stock by governments had been an obsolete practice, until revived by the framers of the American Constitution and made a vital part of that instrument. The right of the most—and not of the richest, the best, the bravest, the cleverest, or the oldest in blood—to rule being formally recognized and set down on paper, it became necessary to ascertain at stated intervals who were the most. The lords of the soil, instead of being inducted into power on the death of their parents with great pother of ointment, Te Deum, heraldry, drum and trumpet, were chosen every ten years by a corps of humble knights of the pencil and schedule.

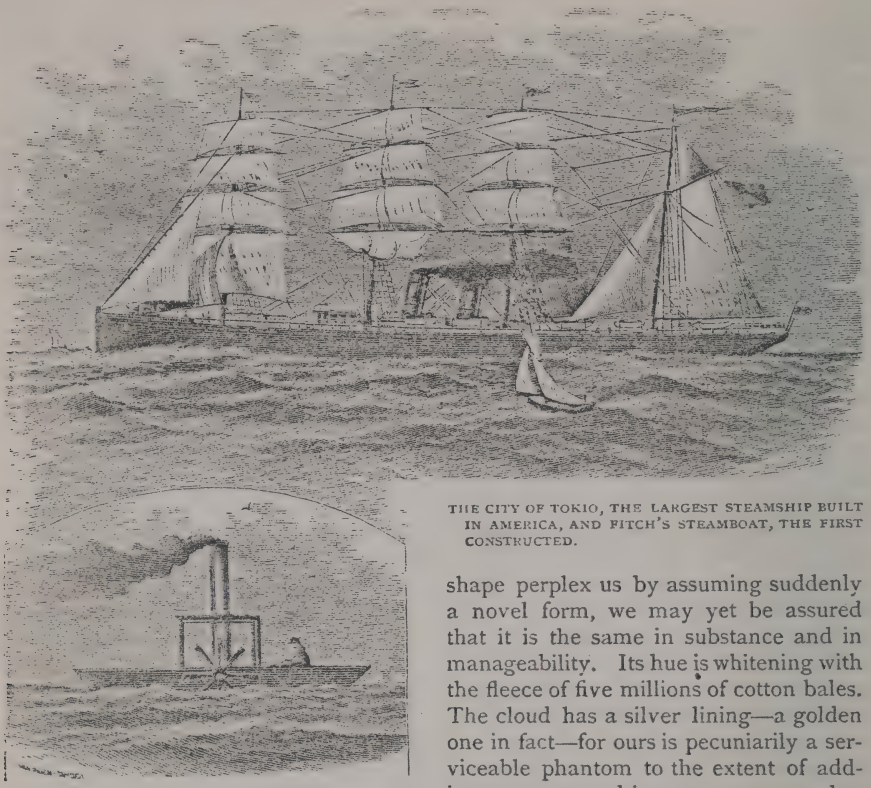
To these disposers of empire, the enhancement and complication of whose toil has been a labor of love with each decennial Congress, we owe the knowledge that eighty years, out of the hundred, brought the people of the Union up from a tally of 3,929,214 in 1790 to 38,558,371 in 1870, and that down to the beginning of the last decade the rate of increment adhered closely to 35 per cent. On that basis of growth the latest return falls nearly four millions short. One of the causes of this is "too obvious" (and too disagreeable) "to mention;" but it is inadequate. The sharp demarcation of the western frontier by the grasshopper and the hygrometer is another, which will continue to operate until, by irrigation, tree-planting or some other device, a new climate can be manufactured for the Plains. The teeming West, that of old needed only to be tickled with a hoe to laugh with a harvest, has disappeared. At least what is left of it has lost the power of suction that was wont to reach across the ocean, pull Ballys and Dorfs up by the roots and transplant them bodily to the Muskingum and the Des Moines. A third cause, operating still strongly more within the current decade, is attributable to another mode in which that attractive power has been exerted—the absorption from the

European purse for the construction of railways of seven or eight times as much as the thirty-five millions in specie it took to fight through the Revolutionary war. For a while, Hans came with his thalers, but they outfooted him—"fast and faster" behind came "unmerciful disaster," and he was fain to turn his back on the land of promise and promises. Similar set-backs, however, are interspersed through our previous history, and the influence of the last one may be overrated.

In truth, the Old World's fund of humanity is not sufficiently ample to keep up the pace; and the rate of natural increase is no longer what it was when the country was all new, and cornfield and nursery vied in fecundity. That the former source of augmentation is gaining in proportion upon the latter is apparent from the last three returns. The ratio of foreign-born inhabitants to the aggregate in 1850 was 9.68 per cent., in 1860, 13.16, and in 1870, 14.44. In the last-named year, moreover, 10,892,015, or 28 per cent. of the entire population, white and black, are credited with foreign parentage on one or both sides. Excluding the colored element, ranked as all native, this proportion rises to 32 per cent.

Judged by the test of language, three-fifths of those who are of foreign birth disappear from the roll of foreigners, 3,119,705 out of 5,567,229 having come from the British Isles and British America. Germany, including Bohemia, Holland and Switzerland, sums up 1,883,285; Scandinavia, 241,685; and France and Belgium, 128,955. The Celtic influx from Ireland, and the Teutonic and Norse together, form two currents of almost identical volume. Compared with either, the contribution of the Latin or the Romance races sinks into insignificance—an insignificance, however, that shows itself chiefly in numbers, the traces of their character and influence being, relatively to their numerical strength, marked. The immigrants from Northern and Southern Europe have a disposition, in choosing their new homes, to follow latitude, or rather the isotherms; the Northmen skirting the Canadian frontier and grouping themselves on the coldest side of Lake Michigan, while the Italians, Spaniards and French drift toward the Gulf States. The Irish and Germans are more cosmopolitan, each in a like degree. They disperse with less regard to climate or surroundings, and are more rapidly and imperceptibly absorbed and blended, thus promoting rather than marring the homogeneity of the American people. The Germans are, however, more prone to "colonizing" than the Irish—a circumstance due in great measure to their differing in language from the mass of their new neighbors. This cause of isolation is gradually losing its weight, the recognition of the German tongue by State legislatures, municipalities, etc. being less common than formerly, notwithstanding the immense immigration so calculated to extend it.

While assimilation has been growing more complete, and a fixed resultant becoming more discernible, the ingredients of this ethnic medley do not seem to have materially varied in their proportions since the beginning of the century. They present a tolerably close parallel to the like process in Northern France, where Celt and Teuton combined in nearly equal numbers, with, as in our case, a limited local infusion of the Norse. The result cannot, however, be identical, the French lacking our Anglo-Saxon substratum, with its valuable traditions and habitudes of political thought. The balance between impulse and conservatism has never been, in this country, long or seriously disturbed, and is probably as sound now as a hundred years ago. In the discussions of the twenty years which embrace our Revolutionary period we find abundance of theory, but they were never carried by abstractions out of sight of the practical. Our publicists were not misled by convictions of the "infinite perfectibility of the human mind," the motive proclaimed by Condorcet, writing in sweet obliviousness of the guillotine, as explaining "how much more pure, accurate and profound are the principles upon which the constitution and laws of France have been formed than those



THE CITY OF TOKIO, THE LARGEST STEAMSHIP BUILT IN AMERICA, AND FITCH'S STEAMBOAT, THE FIRST CONSTRUCTED.

which directed the Americans." The lack of this equilibrium among the pure, and, as we may venture to term them, the untrained races, we have occasional opportunities of noting on our own soil when for a passing cause they resort to isolated action.

A race-question of a character that cannot be supplied by differentiation within Caucasian limits haunts us as it has done from the very birth of the colonies. Like the Wild Huntsman, we have had the sable spectre close beside us through the whole run. But, more fortunate than he, we see it begin to fade. At least its outlines are contracting. The ratio of colored inhabitants to the aggregate, in 1790 19.26 per cent., or one-fifth, fell in 1860 to 14.12, or one-seventh, and in 1870 to 12.65, or an eighth. The next census will beyond doubt point more strongly in the same direction. If, whilst dwindling in magnitude, the dusky shape perplex us by assuming suddenly a novel form, we may yet be assured that it is the same in substance and in manageability. Its hue is whitening with the fleece of five millions of cotton bales. The cloud has a silver lining—a golden one in fact—for ours is pecuniarily a serviceable phantom to the extent of adding to our annual income a sum equal to eight or ten times the entire yearly export of the colonies. Should he lead us, like the Land-und-Wild-Graf, into the pit of ruin, he will have first bottomed it with an ample and soft cushion of lint whereon to fall.

'Extremes meet, and modern culture, like ancient anarchy, drives its people into cities. Such is the tendency on both sides of the ocean. Improvement must result from associated effort, and of that cities are the last expression. All the European towns are outgrowing the rural districts. With us the change states itself in an advance, since 1790, of the city population from 3.4 to 20.9 per cent. of the aggregate. Broadcloth has gained on homespun in the proportion of six to one, Giles having thus six mouths to fill where he formerly had but one. We shall show farther on how gallantly he meets this draft. New York, with its suburbs, contains more Germans than

THE COTTON GIN.

any German city save Vienna and Berlin, more Irish than Dublin, and more English-speaking inhabitants than Liverpool, Birmingham, Manchester, Bristol and Leeds together. All the colonial towns in a lump would scarce add a twentieth to her numbers, and her militia embraces nearly twice as many men as served, first and last, in the Continental army.

But the column that sums the souls does not state the complete life of the cities. Man has in our day a host of allies that work with him and at his command—slaves of iron, steel and brass wholly unknown to our great-grandfathers—fed also by the farmer, through the miner as an intermediate. Steam-engines, to the number of 40,191, and of 1,215,711 horse-power—all of the stationary variety, and exclusive of nearly half as many that traverse the country and may be classed among the rural population—have succeeded the websters and spinners who were wont to clothe all the world and his wife, and who survive only in the surnames of some of our statesmen and financiers. Not that they confine their labors to textile fabrics. Their iron fingers are in every pie, including that of the printer, who is answered, when he calls the roll of his serfs of steam, by 691 whistles. And he is one of the smallest of the slave-holders—a mere ten-bale man. India-rubber, a product known a century ago only by some little black lumps used by draughtsmen to erase pencil-marks, owns enough of them to equal 4412 horses or 22,000 No. 1 field-hands. Boots and shoes not of the India-rubber variety employ 3212 horse-power or 15,000 steam Crispins, over and above their Christian fellows who stick solitary to the last, and who, it must be owned, produce an article more of the Revolutionary type and more solid and durable. As a cord-wainer Steam is a failure; but he works cheaply, and will continue to hammer on, and disseminate his commodity of brown paper throughout the temperate zone. Three-fourths of the population of the globe still runs unshod, however, and it is obvious that this crying want cannot be met by the old system. Steam will perforce keep pegging away till Cathay, Xipangu, India and all the isles awaken to the absurdity of walking on cotton or undressed human skin. Could one of our 299 fire-fed cobblers have been set to work at Valley Forge, backed by one of the 1057 makers of woolen that are similarly nourished!

But we do Mr. Watt's lusty bantling

injustice in assigning him exclusively the tastes of a cit. He is not insensible to pastoral charms, and often selects a home among the hemlocks and under the broad-armed oaks, by bosky glen or open mead, wherever the brooklet brawls or dreams, for he sticks to the waterside like a beaver. Here he sits down, like an artist as he is, until he has got all the choice bits of the grove. The large and bustling family of the sawyers, both top and bottom, he has utterly banished from their ancient haunts. There would be needed a million and a half of them to take the places of 11,199 steam-engines, of 314,774 horse-power, that are devastating our forests. An equal number is replaced by the 16,559 water-wheels, of 326,728 horse-power, engaged in the same field of havoc. Armed with the handsaw, all the Revolutionary patriots and Tories together, withdrawing their attention entirely from military affairs, as well as from all other mundane concerns, would not have turned out one-sixth of the quantity of lumber demanded by their descendants of a period that boasts itself the age of iron, and has as little as possible to do with wood. And if we place in the hands of the patriarchs the ancestral axes, and tell them to get out charcoal for smelting three millions of tons of iron, to be hauled an average of a hundred miles to market by oxen over roads whose highest type was the corduroy, the imagination reels at the helplessness of the heroes.

The paternal thoughtfulness of the home government employed itself in relieving the colonist from such exhausting drafts upon his energies. It sedulously prohibited his throwing himself away on the manufacture of iron or of anything else. In 1750 it placed him under a penalty of £200 for erecting a rolling-mill, tilt-hammer or steel-furnace. Lest the governor of the colony should fail to enforce this statute and protect the pioneer from such a waste of time, it held that functionary to a personal forfeit of £500 for failing, within thirty days after presentment by two witnesses on oath, to abate as a nuisance every such mill, engine, etc. As this mulct would have made a serious inroad on the emoluments of the royal governors, even with the addition of the inaugural douceur customarily given by the provincial assemblies to each new incumbent—in Virginia regularly £500, doubled in the instance of Fauquier in

GRAIN ELEVATOR.

1758, when it was desired to drive the entering wedge of disestablishment and razee the parsons—we are prepared to believe that the iron business was not flourishing. Under a despotism tempered so very moderately by bribes, a similar blight fell upon all other branches of manufacture. Among these, wool, flax, paper, hats and leather are specified in a Parliamentary report as interfering with "the trade, navigation and manufactures" of the mother-country. An act of Parliament accordingly forbade the exportation of hats to foreign countries, and even from one colony to another.

That, after such a course of repression, the country found itself wholly unprepared on the attainment of independence to make any headway in this field, is no matter of surprise. Thirty years elapsed before the manufacturing statistics of the Union became presentable. In 1810 they were reckoned at $198,613,471. This embraces every fruit of handicraft, from a barrel of flour and a bushel of lime to a silk dress. We had 122,647 spindles and 325,392 looms, made 53,908 tons of pig iron, and refined about one pound of sugar for each head of the population. In 1870, after sixty years of tossing between the Scylla and Charybdis of tariffs, "black" and white, the yield of our factories had mounted to the respectable sum of $4,232,325,442. They employed 2,053,996 operatives. Of these, the average wages were $377, against $289 in 1860 and $247 in 1850, yearly. The advance in the product of refined sugar may be cited as illustrative of the progress of the people in comfort and luxury. It reached a value of one hundred and nine millions, representing nearly ten times as many pounds, or twenty-eight pounds a head. This exemplification is but one in an endless list.

Manufactures have come to figure respectably in our exports. They exceed in that list, by three or four to one, the entire exports of all kinds in 1790; and they equal the average aggregate of the years from 1815 to 1824. But the multiplication of the wants of a people rapidly growing in numbers and refinement will, with the comparatively high price of labor, scarcity of capital and distance of most of our ports from the markets supplied by European manufactures, for a long time to come make the home-supply the chief care of our artisans. They have, for such and other reasons, in some points lost ground of late. The revolution in the propulsion and construction of ships, for instance, has not found them prepared to take the advantage they have usually done of improvements. Not only do the British screw-steamers take undisputed possession of our trade with their own country, but they expel our once unrivaled craft from the harbors of other quarters of the globe, and threaten to monopolize the most profitable part of our carrying-trade with all countries. This result is more easily explained than the inroads made on our more ordinary foreign traffic, in sailing vessels, by the mercantile marine of second- and third-rate powers. This is eloquently told by the annual government returns and the daily shipping-list. While our coastwise tonnage increases, that employed in foreign trade remains stationary or declines. The bearing of this upon our naval future becomes an imperative question for our merchants and legislators. The United States is benevolently and gratuitously building up a marine for each of half a dozen European states which possess little or no commerce of their own, and multiplying the ships and sailors of our chief maritime rival. We have long since ceased to import locomotives, and have, within the past two years, almost ceased to import railroad iron. Our iron-workers obtain coal at nearly or quite as low prices as do those of Birkenhead or the Clyde. They have recently sent to sea some large screw-steamers that perform well. No insurmountable difficulty appears to prevent the launching of more until we have enough to serve at least our direct trade with Europe and China. That determined, it may be possible to ascertain whether we cannot assist Norway, Belgium and Sicily in carrying our cotton, wheat and tobacco to the purchasers of it.

This decline in American tonnage is, it must be added, only relative, whether the comparison be made with other countries or with our own past. The returns show a carrying capacity in our ships more than twenty-fold that of 1789, and three times that of 1807; when, on the other hand, it exceeded in the ratio of fourteen to twelve that of 1829, twenty-two years later. This interest is peculiarly subject to fluctuations; some of which in the past have been less explicable than the one it is now undergoing. Another decade may turn the tables, and restore the flag of the old Liverpool liners to their fleeter but less shapely supplanters. The steamer and the clipper are both American inventions. Why not their combination ours as well? The centenary of Rumsey's boat, not due till December 11, 1887, should not find its descendants lording the ocean under another flag.

INTERIOR OF A POSTAL CAR.

The monthly Falmouth packet of a century ago, sufficient till within the past two generations for the mail communication of the two continents, has grown into six or eight steamships weekly, each capable of carrying a pair of the old sloops in her hold, and making the passage westwardly in a fifth and eastwardly in a third of the time. Can it be but ninety years ago that the latest dates at New York (February 14, 1786) from London (December 7, 1785) brought as a leading item from Paris (November 20) the news that Philippe Égalité had by his father's death just come into four millions of livres a year, that six hundred thousand livres paid by the Crown to his father thereupon devolved to Monsieur (afterward Louis XVIII.), and that the latter had kept up the game of shuttlecock with the treasure of the French by "a donation of all his estates to the duke of Normandy, the younger son of their Majesties, preserving for himself the use and profits thereof during his life"? That was a short winter-passage, too—more speedy than the land-trip of a letter in the same journal "from a gentleman in the Western country to his friend in Connecticut, dated River Muskingum, November 5, 1785," describing a voyage down the Ohio from Fort Pitt and the wonders of the country much as Livingstone and Du Chaillu do those of Africa. The time is less now to Japan, and about the same to New South Wales, with both which countries we have postal conventions—*i. e.*, a practically consolidated service—far cheaper and more convenient than that maintained on the adoption of

the present Constitution between our own cities. Our foreign service with leading countries is combined, moreover, with an institution undreamed of in that day—the money-order system. Under this admirable contrivance the post-offices of the world will ere long be so many banks of deposit and exchange for the benefit of the masses, effecting transfers mutually with much greater facility, rapidity and security than the regular banks formerly attained.

Still in its infancy, the international money-order system has already reached importance in the magnitude of its operations. The sums sent by means of it were, in 1874, $1,499,320 to Great Britain, $701,634 to Germany, and to the little inland republic of Switzerland $72.287.

The dimensions to which this new method of financial intercourse between the different peoples of the globe is destined to reach may be inferred from the growth of the domestic money-order service. In 1874 the number of orders issued was 4,620,633, representing $74,424,854. The erroneous payments having been but one in 59,677, it is plain that this mode of remittance must make further inroads on the old routine of cheque and draft, and become, among its other advantages, a currency regulator of no trifling value.

Our post-office may almost be said to head the development of the century. The other lines of progress in some sense converge to it. The advance of intelligence, of settlement, of transit by land and water and of mechanical and philosophical discovery have all fostered the post, while its return to them has been liberal. Thus aided and spurred, its extension has approached the rate of geometrical progression. Its development resembles that from the Annelids to the Vertebrata, the simple canal which constitutes the internal anatomy of the simplest animal forms finding a counterpart in the line of mails vouchsafed by the British postmaster-general to the colonies in 1775 from Falmouth to Savannah, "with as many cross-posts as he shall see fit." Fifteen years of independence had caused the accretion of wonderfully few ganglia on this primeval structure. In 1790 four millions of inhabitants possessed but seventy-five post-offices and 1875 miles of post-roads. The revenue of the department was $37,935 — little over a thousandth of what it is at present under rates of postage but a fraction of the old. New York and Boston heard from each other three times a week in summer and twice in winter. Philadelphia and New York were more social and luxurious, and insisted on a mail every week-day but one, hurrying it through in two days each way, or a twentieth of the present speed. On the interior routes chaos ruled supreme. Newspapers and business-men combined to employ riders who meandered along the mud roads as it pleased Heaven.

When the new government machine had smoothed down its bearings matters rapidly improved. In 1800 we had 903 post-offices and 20,817 miles of road. In 1820 these figures changed to 4500 and 92,492, and in 1870 to 28,492 offices and 231,232 miles. Five years later 70,083 miles of railway, 15,788 by steamboat and 192,002 of other routes represented the web woven since the Falmouth and Savannah shuttle commenced its weary way. Of course, neither the number of offices nor extent of routes fully measures the change from past to present; mails having become more frequent over the same route, and a new style of office, the locomotive variety, having been added to the old. This innovation, of mounting postmaster and post-office with the mailbags on wheels, and hurling the whole through space at thirty or forty miles an hour, already furnishes us with gigantic statistics. In 1875 there were sixty-two lines of railway postal-cars covering 16,932 miles with 40,109 miles of daily service and 901 peripatetic clerks. These gentlemen, under the demands of the fast mail-trains, will ere long swell from a regiment into a brigade, and so into a division, till poets and painters be called on to drop the theme of "waiting for the mail."

The greater portion of the fifty-odd thousand employés of the department do

not give it their whole time, many of the country postmasters being engaged in other business. But the undivided efforts of them all, with an auxiliary corps, would be demanded for the handling of eight hundred and fifty millions of letters and cards, and a greater bulk of other mail-matter, under the old plan of rates varying according to distance and number of sheets, and not weight—stamps unknown. The introduction of stamps, with coincident reduction and unification of rates, has been the chief factor in the extraordinary increase of correspondence within the past thirty years; the number of letters passing through the mails having within that period multiplied twenty-fold. The number transmitted in the British Islands, then three times greater than in the United States, is now but little in excess, having been in 1874 nine hundred and sixty-seven millions. The immense difference between the two countries in extent, and consequently in the average distance of transportation, is enough to account for the contrast between the two balance-sheets, our department showing a heavy annual deficit, while in Great Britain this is replaced by a profit. As regards post-office progress in the United States, the question is rather an abstract one; for there is not the least probability of an advance in rates. The discrepancy between receipts and expenses will be attacked rather by seeking to reduce the latter at the same time that the former are enhanced by natural growth and by improvement in the details of service and administration.

PROF. S. F. B. MORSE, THE INVENTOR OF THE ELECTRO-MAGNETIC TELEGRAPH.

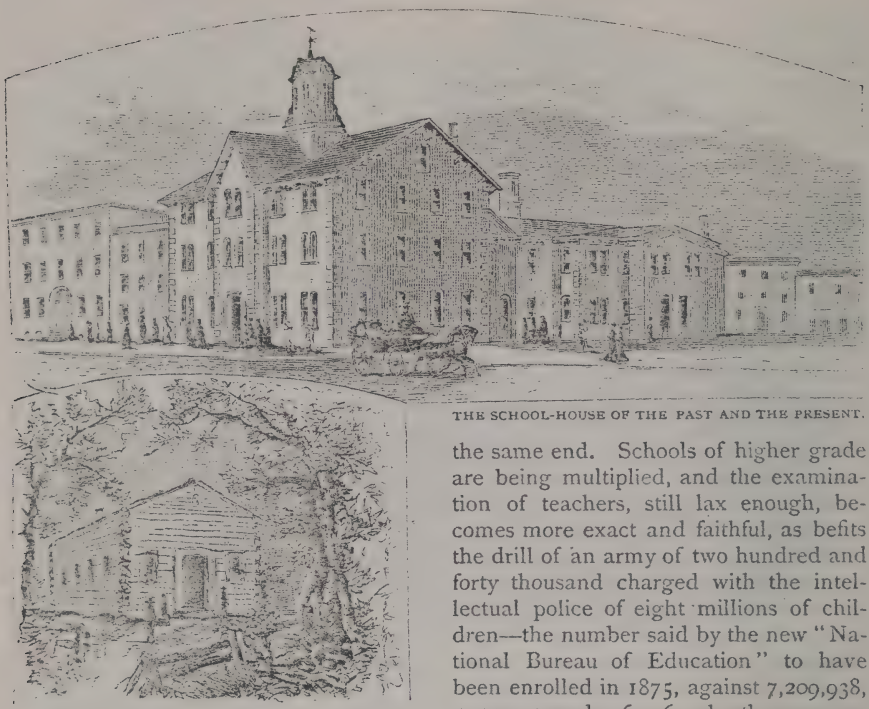
Difficult as it is adequately to state or to measure the extension of the mails within the century, that is far from telling the whole story of the amplitude and celerity with which the people of our day interchange intelligence. Only to the last third of the period under review has the electric telegraph been known. It is now a necessity of the public and private life of every civilized spot upon the globe. It traverses all lands and all seas. The forty miles of wire with which it started from Washington City have become many millions. Its length of line in the United States is about the same with that of the mail-routes, and a similar equality probably obtains in other parts of the world. We have nearly as much line as all Europe together, though the extent of wire may not be so great. It is little to say that this continent, so dim to the founders of the Union, has been by the invention of Morse compressed within whispering distance, the same advantage having been conferred on other countries. It is the property of mankind, and the comparison must be between present and past, not between any two countries of the present. Strictly, a comparison is not possible, nothing like magnetic communication having been known forty years ago, unless to the half imagination,

half realization of one or two closet experimenters. Steam and stamps wrought a difference in degree—the telegraph one of kind. Against eighteen hundred miles of wagon-road we set seventy-three thousand of railway; but two hundred thousand miles of telegraph are opposed by nothing, unless by Franklin's kite-string. Looked at along the perspective of poles, the old days disappear entirely—the patriots become pre-historic. Yet modern self-conceit is somewhat checked by the reflection that the career of these two great agents of intercommunication has but just opened; that their management even yet remains a puzzle to us; and that the next generation may wonder how we happened to get hold of implements whose use and capabilities we so poorly comprehended. So far as prediction can now be ventured, a force and pathway more economical than coal and the rail will not soon be forthcoming; nor is Canton apt to "interview" New York at the rate of more words in a minute over a single wire than she can now. Some day dynamite may be harnessed to the balloon, which stands, or drifts, where it did with Montgolfier, and we may all become long-range projectiles; but even this age of hurry will contentedly wait a little for that.

Possibly the Post-office Department would be less of a valetudinarian, financially, had it confined itself to its legitimate occupation, the speeding of intercourse and wafting of sighs, and not yielded to the heavy temptation of disseminating shoes, pistols and garden-seeds over three millions of square miles. Newspapers are enough to test its powers as a freight-agent. Where these and their literary kindred of books, magazines, etc. used to be estimated by the dozen and the ounce, the ton is becoming too small a unit.

West of the Blue Ridge, or the front line of the Alleghany, so called in most of its length, there was not a newspaper published in 1776. Ten years later, scarcely more than one—the *Pittsburg Gazette*—existed west of the mountains. The few in the seaboard towns kept alive the name, and little more. In 1850, '60 and '70 the periodicals of the Union numbered, respectively, 2526, 4051 and 5871, with an average circulation, at the three periods, of twenty-one hundred, thirty-four hundred and thirty-six hundred copies each. The circulation thus outgrew the numbers in the proportion of nearly two to one. And both are largely in excess of the increase of the population, that being in the twenty years but 65 per cent. The number of daily papers (254 in 1850 and 574 in 1870) must now be equal to the entire number of periodicals in France outside of Paris (796 in 1875), with an average issue less than half that of ours. The proportion of readers to the population, certainly in this class of literature, thus appears to be rapidly growing; and the change is most striking if we take, for example, that group of periodicals which are most purely literary and most remote from the mere chronicle. The returns for the three periods place the monthlies at, respectively, 100, 280 and 622—an advance of sixfold.

The magazine leads us to the door of the library; and here the exhibit is still more marked, significant and gratifying. The census figures are, for many reasons, extremely confused, but in the general result they cannot be outrageously wrong, and they can mislead us only in degree as to the immense multiplication of books in both public and private libraries. The returns are manifestly far below the truth. To give them here without the explanations accompanying them in the census volumes would mislead; and those explanations, or a fair synopsis of them, would occupy too much space, and would, after all, leave the problem unsolved. That the supply of books has fully kept pace with every other means of culture is patent enough. The Congressional Library has risen in half the century from the shelves of a closet to nearly four hundred thousand volumes—an accumulation not surpassed to-day by more than two libraries in Europe. It now demands a separate edifice of its own, fit to stand by the side of the fine structures which have within a generation recreated the architectural aspect of the Federal metropolis with the most stately govern-



THE SCHOOL-HOUSE OF THE PAST AND THE PRESENT.

ment-offices in the world. Other public libraries, belonging to colleges, schools, societies and independent endowments, show similar progress. While none of them are equal, for reference, to some of the great European establishments, they are generally better adapted to the purposes of popular instruction. Their literary wealth is fresh and available, little encumbered by lumber kept merely because old or curious. Thus adjuncts, in some sort, of the newspaper and the common school, their catalogues prove, as do the bookcases of private houses, that the newest and deepest results of European thought and inquiry are eagerly sought and used by our people.

Our system of public schools, long classed among the "peculiar institutions" of the country, is notably gaining in scope and efficiency, be the English and Prussians right or not in their claim of greater thoroughness and a higher curriculum. The different States have engaged in a series of competitive experiments for the common good, and cities and counties, in their sphere, labor to the same end. Schools of higher grade are being multiplied, and the examination of teachers, still lax enough, becomes more exact and faithful, as befits the drill of an army of two hundred and forty thousand charged with the intellectual police of eight millions of children—the number said by the new "National Bureau of Education" to have been enrolled in 1875, against 7,209,938, 5,477,037 and 3,642,694 by the censuses of 1870, '60 and '50. Little more than half this number is estimated by the Bureau to represent the average daily attendance, which is quite compatible with the attendance, for the greater part of the school-year, of nine-tenths of the whole number on the lists. A comparison of the number enrolled and the entire supposed number of children between six and sixteen leaves an excess of nearly two millions and a half outside the public schools. Of these private schools will account, and account well, for a large proportion. The latter institutions are fulfilling indispensable offices, one being that of normal schools—a want likely to be inadequately satisfied for a long time to come.

In one respect our public schools are beyond, though not above, comparison with those of the most advanced European states. An annual outlay of a trifle less than seventy-five millions of dollars, with an investment in buildings, ground, etc. of a hundred and sixty-six millions, implies a determination that should be rewarded with the most unex-

ceptionable results. It reaches eighteen dollars yearly, leaving out the interest on the fixed stock, for each child in daily attendance. Such an expenditure, trebling, we believe, that of Prussia, ought to secure better teachers and a higher range of instruction. It must be said, however, that the duties of the school-boards are as honestly and economically discharged as those of any other public bodies; that the cost for each pupil is highest where common schools have been longest established and most thoroughly studied; and that the statistics certainly show a steady advance in their efficiency. That is the truest test. Any pecuniary means are justifiable by the end. If common schools, themselves a means to a higher education, mental and moral, than they can directly afford, take some part of the wealth we accumulate to prevent our men's decaying, it is well used. It helps to purchase for us progress more genuine than that whereof railways and cotton-factories are the exponents.

It is thus a guarantee of a brighter century even than the one just closed that, in the wildest quarter of the still unkempt continent, the school actually precedes the pioneer. Choose his homestead where he may, the sixteenth section is staked out before it. From it the rills of knowledge soon trickle along the first furrows, as strange to the soil as its new products. It provides the modern settler in advance with an equipment, mental and material, if not moral, altogether superior to that of his colonial prototype, that enables him in a shorter time to impart a higher stamp to his surroundings. He attacks the prairie with a plough unimagined by his predecessor; cuts his wheat with a cradle—or, given a neighbor or two, a reaper—instead of a sickle; sends into the boundless pasture the nucleus of a merino flock, and returns at evening to a home rugged enough, in unison with its surroundings, but brightened by traits of culture and intelligence which must adhere to any ménage of to-day and were out of reach of any of the olden time. The civilization that travels West now is a different thing from that which went West a hundred years ago.

Science has done much for the farmer, though not as much as he has done for it and its hotbeds, the towns. In one point his shortcomings are notable. He has not learned how to eat his cake and have it. He works the virgin soil as the miner does the coal-seam. What Nature has placed in it he takes out, and, until forced by the pressure of his friends and enemies, the cities, returns no nest-egg of future fertility. So it is that many portions of the rural East have to be resettled and started afresh in the process of agricultural redemption. A hundred years ago England grew fifteen bushels of wheat to the acre. Her standard is now thirty-two. Within three-quarters of the century New York has fallen from twenty-five to twelve; and half that period, again, has brought Ohio and Indiana from thirty to fifteen. But this process is a natural part of the sum of American progress. Land was the only property of the country originally, and subsequently of different parts of it in succession. It was used like any other commodity, and worn out like leather or cloth. The original cuticle of the continent has disappeared for ever. The task now is to induce the granulation of a new one. The restorative process may be complete by the time we have four hundred souls to the square mile, like England and Flanders. Meanwhile, the exporting of Iowa and California in the shape of wheat is going on at what must be esteemed a profitable rate; for our farmers, as a class, do not seem to be losing ground. Their glebes have risen in value from thirty-two hundred millions in 1850 to sixty-six hundred ten years later, and ninety-three hundred in 1870. This has been accompanied by a diminution of their average extent, the farm of 1870 covering a hundred and fifty-three acres. This is small enough, considering the capital necessary for stock in these days of improved and costly implements, when a farmer can no longer pack his entire kit in a cart. It matches closely the size of English holdings, where agricultural science is at its height. The

French peasant-farmers, with their plats of three and four acres, are chained to the spade and hoe, and their steading becomes a poultry-yard — a consummation we are not yet in sight of, as is proved by the legions of pigs and beeves, barreled or bellowing, that roll in from the ancient realms of Pontiac and the Prophet with a smoothness and velocity unattained by the most luxurious coach that carried a First Congressman.

Everything that makes a nation, we are told, and the nation itself, is the product of the soil. But the less immediate, finer and most delicate fruits cannot usually be garnered until the soil is thoroughly subdued. The mass of matter keeps the intellectual in abeyance. Were Europe enlarged one-half, and her population reduced to one-eighth what it actually is, the spectacle of culture she now presents would be an impossibility. It is our merit that, thus brought to American conditions, she would in no way compare with American achievement. An offset wherewith we must at the same time be debited is the aid we have, in so many forms, derived from her. Making every allowance for this, it is a clear credit in our favor that one-tenth of Christendom should have done so much more than a tenth of its effective thinking simultaneously with taming the most savage half of its domain. We have more than our share of laborers in the mental vineyard, though fewer of them are master-workmen. We utilize for Europe herself, and send back to her in its first available shape, much of what her students produce. As between thought and substance, the two continents interchange offices. We import the crude material her philosophers harvest or mine, work it up and return it, just as she takes the yield of our non-metaphorical fields and strata and restores it manufactured. Much of the social, political and industrial advancement of Europe within the century she may be said to owe to the United States. Her governmental reforms certainly and confessedly found here their germ. These gave birth to others of a social character. In this manner, as well as more directly by our commerce, inventions and example, we have stimulated her industry. We have spread before her the two oceans, and taught her to traverse them with a firm and masterful mien, no longer

> As one who in a lonely road doth walk in fear and dread.

We have created cities upon her havens, Parliaments in her capitals, and stronger hearts and quicker hands in her villages. No community on her varied surface but is the better for America. That our people and their labors have done it all it would be absurd to say; but the Old World's progress in the period under review can be but very partially accounted for by any internal force of its own. None of its rulers or peoples adventure a reform of any kind without a preliminary, if often only a half-conscious, glance of inquiry westward. Collectively as members of a European republic of nations, and internally each within itself, they have in this way learned, after many recalcitrant struggles, to recognize and respect local independence. Municipal law has gained new life. The commune has become an entity everywhere, and the nations which it informs have established the right to readjust or recast their constitutions without being hounded down as disturbers of the peace. The contribution of the American Union to such results would earn it honor at the hands of history were it to sink into nothing to-morrow. Had no such tangible fruits hitherto ripened, some portion of such honor would still accrue to it for having shown that a people may grow from a handful to an empire without hereditary rulers, without a privileged class, without a state Church, without a standing army, without tumult in the largest cities and without stagnant savagery in the remotest wilds.

PART III.

PAST EXPOSITIONS.

THE GREAT ANNUAL FAIR AT NIZHNEE-NOVGOROD.

WE have presented a feeble sketch of a century that stands out from its fellows, not as a mere continuation, or even intensification, of them—a hundred annual circuits of the earth in its orbit as little distinguished by intellectual or material achievement as those repetitions of the old beaten track through space are by astronomical incident—but as an epoch *sui generis*, a century *d'élite*, picked out from the long ranks of time for special service, charged by Fate with an extraordinary duty, and decorated for its successful performance. Those of its historic comrades even partially so honored are few indeed. They will not make a platoon — scarce a corporal's guard. We should seek them, for instance, in

CRYSTAL PALACE—LONDON EXHIBITION BUILDING, 1851.

the Periclean age, when eternal beauty, and something very like eternal truth, gained a habitation upon earth through the chisel and the pen; in the first years of the Roman empire, when the whole temperate zone west of China found itself politically and socially a unit, at rest but for the labors of peace; and in the sixteenth century, when the area fit for the support of man was suddenly doubled, when the nominal value of his possessions was additionally doubled by the mines of Mexico and Peru, and when his mental implements were in a far greater proportion multiplied by the press.

The last of these periods comes nearest to our standard. The first had undying brilliance in certain fields, but the scope of its influence was geographically narrow, and its excessively active thought was not what we are wont to consider practically productive, its conquests in the domain of physical science being but slender. The second was in no sense originative, mankind being occupied, quietly and industriously, in making themselves comfortable in the pleasant hush after the secular rattle of spear and shield. The third was certainly full of results in art, science and the diffusion of intelligence through the upper and middle strata of society. It might well have celebrated the first centennial of the discovery of printing or of the discovery of America by assembling the fresh triumphs of European art, so wonderful to us in their decay, with the still more novel productions of Portuguese India and Spanish America. But the length of sea-voyages prosecuted in small vessels with imperfect knowledge of winds and currents, and the difficulties of land-transportation when roads were almost unknown, would have restricted the display to meagre proportions, particularly had Vienna been the site selected. Few visitors could have attended from distant countries, and the masses of the vicinage could only have stared. The idea, indeed, of getting up an exhibition to be chiefly supported by the intelligent curiosity of the bulk of the people would not have been apt to occur to any one. The political and educational condition

of these was at the end of the century much what it had been at the beginning. Labor and the laborer had gained little.

The weapon-show, depicted in *Old Mortality*, and the market-fair, as vivid in the *Vicar of Wakefield*, exemplify the expositions of those days. To them were added a variety of church festivals, or "functions," still a great feature of the life of Catholic countries. Trade and frolic divided these among themselves in infinite gradation of respective share, now the ell-wand, and now the quarter-staff or the fiddler's bow, representing the sceptre of the Lord of Misrule. "At Christe's Kirk on the Grene that day" the Donnybrook element would appear to have predominated. The mercantile feature was naturally preferred by gentle Goldy, and the hapless investor in green spectacles may be counted the first dissatisfied exhibitor on record at a modern exposition, for he skirts the century.

Looking eastward, we find these rallies of the people, the time-honored stalking-grounds of tale-writers and students of character generally, swell into more imposing proportions. The sea dwindles and the land broadens. Transportation and travel become difficult and hazardous. Merchant and customer, running alike a labyrinthine gauntlet of taxes, tolls and arbitrary exactions by the wolves of schloss and château, found it safest to make fewer trips and concentrate their transactions. The great nations, with many secondary trade-tournaments, as they may be termed, had each a principal one. From the great fair of Leipsic, with the intellectual but very bulky commodity of books for its specialty to-day, we pass to the two Novgorods — one of them no more than a tradition, having been annihilated by Peter the Great when, with the instinct of great rulers for deep water, he located the new capital of his vast interior empire on the only available harbor it possessed. Its successor, known from its numerous namesakes by the designation of "New," draws convoys of merchandise from a vast tributary belt bounded by the Arctic and North Pacific oceans and the deserts of Khiva. This traffic exceeds a hundred millions of dollars annually. The medley of tongues and products due to the united contributions of Northern Siberia, China and Turkestan is hardly to be paralleled elsewhere on the globe. *Was*, insists the all-conquering railway as it moves inexorably eastward, and relegates the New Novgorod, with its modern fairs, to the stranded condition of the old one, with its traditional expositions. As, how-

INTERIOR VIEW OF THE TRANSEPT OF CRYSTAL PALACE.

ever, the rail must have a terminus somewhere, if only temporary, the caravans of camels, oxen, horses, boats and sledges will converge to a movable entrepôt that will assume more and more an inter-Asiatic instead of an inter-national character. The furs, fossil ivory, sheepskins and brick tea brought by them after voyages often reaching a year and eighteen months, come, strictly enough, under the head of raw products. Still, it is the best they can bring; which cannot be said of what Europe offers in exchange—articles mostly of the class and quality succinctly

NEW YORK EXHIBITION BUILDING, 1853.

described as "Brummagem." It is obvious that prizes, diplomas, medals, commissioners and juries would be thrown away here. The palace of glass and iron can only loom in the distant future, like the cloud-castle in Cole's *Voyage of Life*. It may possibly be essayed in a generation or two, when Ekaterinenborg, built up into a great city by the copper, iron, gold, and, above all, the lately-opened coal-mines of the Ural, shall have become the focus of the Yenisei, Amour, Yang-tse and Indus system of railways. But here, again, we are overstepping our century.

To us it seems odd that in the days when an autocratic decree could summarily call up "all the world" to be taxed, and when, in prompt obedience to it, the people of the Roman empire gathered to a thousand cities, the idea of numbering and comparing, side by side, goods, handicrafts, arts, skill, faculties and energies, as well as heads, never occurred to rulers or their counselors. If it did, it was never put in practice. The difficulties to which we have before adverted stood in the way of that combination of individual effort to which the great displays of our day are mainly indebted for their success; but what the government might have accomplished toward overcoming distance and defective means of transport is evidenced by the mighty current of objects of art, luxury and curiosity which flowed toward the metropolis. Obelisks, colossal statues, and elephants and giraffes by the score are articles of traffic not particularly easy to handle even now.

At the annual exposition of the Olympic games we have the feature of a distribution of prizes. They were conferred, however, only on horses, poets and athletes—a conjunction certainly in advance of the "asses and savants" that con-

stituted the especial care of the French army in Egypt, but not up to the modern idea of the comprehensiveness of human effort. While our artists confess it almost a vain hope to rival the cameo brooch that fastened the scanty garment of the Argive charioteer, or the statue spattered with the foam of his horses and shrouded in the dust of his furious wheel —while they are content to be teachable, moreover, by the exquisite embroidery and lacework in gold and cotton thread displayed at another semi-religious and similarly ancient reunion at Benares,— they claim the alliance and support of many classes of craftsmen unrepresented on the Ganges or Ilissus. These were, in the old days, ranked with slaves, many of whom were merchants and tradesmen; and they labor yet in some countries under the social ban of courts, no British merchant or cotton-lord, though the master of millions, being presentable at Buckingham Palace, itself the product of the counting-room and the loom. Little, however, does this slight appear to affect the sensibilities of the noble army of English producers, who loyally rejoice to elevate their constitutional sovereign on their implements and fabrics as the Frankish prolétaires did upon their shield.

The family of expositions with which we are directly concerned is, like others of plebeian origin, at some loss as to the roots of its ancestral tree. We may venture to locate them in the middle of the eighteenth century. In 1756–57 the London Society of Arts offered prizes for specimens of decorative manufactures, such as tapestry, carpets and porcelain. This was part of the same movement with that which brought into being the Royal Academy, with infinitely less success in the promotion of high art than has attended the development of taste, ingenuity and economy in the wider if less pretentious field.

France's first exhibition of industry took place in 1798. It was followed by others under the Consulate and Empire in 1801, 1802, 1806. In 1819 the French expositions became regular. Each year attested an advance, and drew more and more the attention of adjacent countries. The international idea had not yet suggested itself. The tendency was rather to the less than the more comprehensive, geographically speaking. Cities took the cue from the central power, and got up each its own show, of course inviting outside competition. The nearest resemblance to the grand displays of the past quarter of a century was perhaps that of Birmingham in 1849, which had yet no government recognition; but the French exposition of five years earlier had a leading influence in bringing on the London Fair of 1851, which had its inception as early as 1848 — one year before the Birmingham display.

The getting up of a World's Fair was an afterthought; the original design having been simply an illustration of British industrial advancement, in friendly rivalry with that which was becoming, across the Channel, too brilliant to be ignored. The government's contribution, in the first instance, was meagre enough — merely the use of a site. Rough discipline in youth is England's system with all her bantlings. She is but a frosty parent if at bottom kindly, and, when she has a shadow of justification, proud. In the present instance she stands excused by the sore shock caused her conservatism by the conceit of a building of glass and iron four times as long as St. Paul's, high enough to accommodate comfortably one of her ancestral elms, and capacious enough to sustain a general invitation to all mankind to exhibit and admire.

Novelty and innovation attended the first step of the great movement. The design of the structure made architects rub their eyes, and yet its origin was humble and practical enough. The Adam of crystal palaces, like him of Eden, was a gardener. When Joseph Paxton raised the palm-house at Chatsworth he little suspected that he was building for the world—that, to borrow a simile from his own vocation, he was setting a bulb which would expand into a shape of as wide note as the domes of Florence and St. Sophia. And the cost of his new production was so absurdly low — eighty thousand pounds by the contract. The

cheapness of his plan was its great merit in the eyes of the committee, and that which chiefly determined its selection over two hundred and forty-four competitors. This new cathedral for the apotheosis of industry resembled those of the old worship in the attributes of nave, aisles and transepts; and these features have been, by reason in great degree of the requirements of construction, continued in its successors. Galleries were added to the original design to secure space additional to what was naturally deemed at first an ample allowance for all comers. Before ground had been well broken the demands of

CORK EXHIBITION BUILDING, 1853.

British exhibitors alone ran up to four hundred and seventeen thousand superficial feet instead of the two hundred and ten thousand—half the whole area—allotted them. The United States were offered forty thousand feet; France, fifty thousand, afterward increased to sixty-five; the Zollverein, thirty thousand, and India the same. A comparison of the whole number of exhibitors, as distributed between Great Britain and other countries, indicates that the equal division of the superficial space was a tolerably accurate guess. They numbered 7381 from the mother-country and her colonies, and 6556 from the rest of the world. Certainly, a change this from the first French exhibition, held in the dark days of the Directory, when the list reached but 110 names. We shall dismiss the statistics of this exhibition with the remark that it has precedence of its fellows in financial success as well as in time, having cleared a hundred and seventy-odd thousand pounds, and left the Kensington Museum as a memorial of that creditable feat, besides sending its cast-off but still serviceable induviæ to Sydenham, where it enshrines another museum, chiefly of architectural reproductions in plaster, in a sempiternal coruscation of fountains, fireworks and fiddle-bows. The palace of industry has become the palace of the industrial—abundantly useful still if it lure him from the palace of gin. The chrism of Thackeray's inaugural ode will not have been dishonored.

The first of the great fairs, in so many respects a model to all that came after, was beset at the outset by the same difficulty in arrangement encountered by them. How to reconcile the two headings of subjects and nations, groups of

objects and groups of exhibitors, the endowments and progress of different races and the advance of mankind generally in the various fields of effort, was, and is, a problem only approximately to be solved. It was yet more complicated in 1851 from the compression of the entire display into one building of simple and symmetrical form, instead of dispersing certain classes of objects, bulky and requiring special appliances for their proper display, into subsidiary structures—the plan so effectively employed in Fairmount Park. A sort of compromise was arrived at which rendered possible the mapping of both countries and subjects, especially in the reports, and to some extent in the exhibition itself, without making the spectacle one of confusion. The visitor was enabled to accomplish his double voyage through the depths of the sea of glass without a great deal of backing and filling, and to find his log, after it was over, reasonably coherent.

The articles displayed were ranged under thirty heads. The preponderance of matter of fact was shown in the concession of four of these to raw material, nineteen to manufactures, and *one* to the fine arts. Twenty-nine atoms of earth to one of heaven! Of course the one-thirtieth whereinto the multiform and elastic shape of genius was invited, like the afreet into his chest, to condense itself, had to be subdivided—an intaglio and a temple, a scarabæus and a French battle-picture, being very different things. This was accomplished, and the Muses made as comfortable as could be expected. They soon asserted the pre-eminence theirs by right divine, and came to be the leading attraction of the affair, next to the Koh-i-noor. On this barbaric contribution of the gorgeous East the French observers, a little jealous perhaps, were severe. One of them says: "They rely on the sun to make it sparkle," and, when the fog is too thick, on gas. The curiosity about it, in the eyes of this incisive Gaul, was "not the divinity, but the worshipers." All day long a crowd filed solemnly by it under the supervision of a detachment of police, each pilgrim bestowing upon the fetish, "an egg-shaped lump of glass," half a second's adoration, and then moving reluctantly on. Thousands of far more beautiful things were around it, but none embodying in so small a space so many dollars and cents, and none therefore so brilliant in the light of the nineteenth century. As this light, nevertheless, is that in which we live, move and have our being, we must accept it, and turn to substantials, wrought and unwrought.

On our way to this feast of solids we must step for a moment into St. Paul's and listen to the great commemorative concert of sixty-five hundred voices that swept all cavilers, foreign and domestic, off their feet, brought tears to the most sternly critical eye, and caused the composer, Cramer, to exclaim, as he looked up into the great dome, filled with the volume of harmony, "Cosa stupenda! stupenda! La gloria d'Inghilterra!"

A transition, indeed, from this to the foundation of the display, coal and iron—from a concord of sweet sounds to the rumble into hold, car and cart of 35,000,000 tons of coal and 2,500,000 of iron, the yearly product at that time of England! She has since doubled that of iron, and nearly trebled her extract of coal, whatever her progress in the harvest of good music and good pictures. Forced by economical necessity and assisted by chemistry, she makes her fuel, too, go a great deal farther than it did in 1851, when the estimate was that eighty-one per cent. of that consumed in iron-smelting was lost, and when the "duty" of a bushel of coal burnt in a steam-engine was less than half what it now is. The United States have the benefit of these improvements, at the same time that their yield of coal has swelled from four millions of tons at that time to more than fifty now, and of iron in a large though not equal ratio. The Lake Superior region, which rested its claims on a sample of its then annual product of one hundred tons of copper, now exports seven hundred thousand tons of iron ore.

Steel, now replacing iron in some of its heaviest uses, appeared as almost an article of luxury in the shape of knives, scissors and the like. The success of

the Hindus in its production was quite envied and admired, though they had probably advanced little since Porus deemed thirty pounds a present fit for Alexander; their rude appliances beating Sheffield an hour and a half in the four hours demanded by the most adroit forgers of the city of whittles for its elimination from the warm bath of iron and carbon. Bessemer, with his steel-mines,

DUBLIN EXHIBITION BUILDING, 1853.

as his furnaces at the ore-bank may be termed, was then in the future. The steel rails over which we now do most of our traveling were undreamed of. Bar iron did duty on all the eighty-eight hundred miles of American and sixty-five hundred of British railway; not many, if at all, more than are now laid, in this country at least, with steel. This poetic and historic metal has become as truly a raw product as potatoes. The poets will have to drop it. The glory of Toledo—of her swords bent double in the scabbard, of her rapiers that bore into one's interior only the titillating sensation of a spoonful of vanilla ice, and of her decapitating sabres that left the culprit whole so long as he forebore to sneeze—is trodden under foot of men.

In crude materials the Union is at home. It was so in 1851, and is still; but then it was not so much at home in anything else as now. We have advanced in that field too, since we sent no silver, and from Colorado no gold, no canned fruits, meats or fish, and no wine but some Cincinnati Catawba, thin and acid, according to the verdict of the imbibing jury. We adventured timidly into manufacturing competition with the McCormick reaper, which all Europe proceeded straightway to pirate; ten or twelve samples of cotton and three of woolen goods; Ericsson's caloric-engine; a hydrostatic pump; some nautical instruments; Cornelius's chandeliers for burning lard oil—now the light of other days, thanks to our new riches in kerosene; buggies of a tenuity so marvelous in Old-World eyes that their half-inch tires were likened to the miller of Ferrette's legs, so thin that Talleyrand pronounced his standing an act of the most desperate bravery; soap enough to answer Coleridge's cry for a detergent for the lower Rhine; and one bridge model, forerunner of the superb iron erections that have since leaped over rivers and ravines in hundreds.

Meagre enough was the display of our craftsmen by the side of that made by their brethren of the other side. It could have been scarce visible to Britannia, looking down from a pinnacle of calico ready for a year's export over and above her home consumption, long enough, if

unrolled, to put a girdle thirty times round the globe, though not all of it warranted to stand the washing-test that would be imposed by the briny part of the circuit.

And yet there were visible in the American department germs of original inventions and adaptations, the development and fructification of which in the near future were foreseen by acute observers. Our metallic life-boats were then unknown to other countries, those of England being all of wood. The screw-propeller was quite a new thing, though the Princeton had carried it, or been carried by it, into the Mediterranean ten years before. Engines designed for its propulsion attracted special attention. The side-wheel reigned supreme among British war-steamers, although some of the altered liners which cut such an imposing figure till the Sebastopol forts in '55 checked, and iron-clads in '62 finished, their career, were under way. A model of one of them, The Queen, was exhibited as the highest exemplification of "the progress of art as applied to shipbuilding during the last eighteen centuries"—a progress entirely eclipsed by that of the subsequent eighteen years.

We sent no steam fire-engines, no locomotives, and no cars. Our great printing-presses, since largely borrowed from and imported by Europe, were scarcely noticed. Not so with "a most beautiful little machine" for making card wire-cloth, copied from America. Recognition of the supreme merits of the pianos of Chickering, Steinway and the rest was still wanting, Erard's Parisian instruments bearing the bell. Borden's meat-biscuit—to revert to the practical—caused quite a sensation, the Admiralty being overloaded with spoiled and condemned *preserved* meat. The American daguerreotypes on exhibition were pronounced decidedly superior to those of France, and still more to those of England. Whipple displayed the first photograph taken of the moon, thus securing to this country the credit of having broken ground for the application of the new art to astronomy. No photograph of a star or of the sun had been obtained. The distance between the United States and Europe in the application and improvement of photography cannot be said, notwithstanding our advantage in climate, to have been since widened. A field of competition still lies open before them in the fixing of color by the camera and the sensitive surface. The sun still insists on doing his work with India ink and keeping his spectral palette strictly to himself. For cheap and popular renderings of color man was then, as now, fain to have recourse to the press. The English exhibited some chromatic printing, far inferior to the chromo-lithographs of to-day.

And this brings us to art. One out of thirty in the programme, it was, as it always will be on these occasions, nearer thirty to one in the estimation of assembled sight-seers. The dry goods and machinery, even the bald, shadeless and ugly (however comfortable) model cottages of the inevitable Prince Albert, failed to draw like the things which flattered the lust of the eye; as the pigs and pumpkins of an "agricultural horse-trot" attract but a wayside glance from the procession to the grand stand. We are all dwellers in a vast picture-gallery, with frescoed dome above and polychromed sculpture and mosaic pavement on the floor below. Its merits we perceive, enjoy and interpret according to our individual gifts and education. But it makes amateurs in some sort of every mother's son or daughter of us; and we hasten to plunge, confident each in his particular grammar of the beautiful, into the study of what imitative gallery may be offered us. Though the financial idea may have been uppermost in the minds of the devotees of the Mountain of Light, and their pleasure in the march past that of a stroll through the vaults of the Bank of England, they also expected to see in it the combined brilliance of all diamonds. Not finding that, we dare say few of them paid it a second visit, but, led by a like craving for dazzle, sought more legitimate intoxication in marble, canvas, porcelain and chased and cast metals.

There they saw the diamond put into harness by the Hindus and used for drilling gems as it is now for drilling railway tunnels. In the carpets and shawls of the same region was to be traced an exact and unfaltering instinct for color, the tints falling into their proper places like those of the rainbow—the result not a picture, any more than the rainbow is a picture, but a blotted study rubbed up

MUNICH EXHIBITION BUILDING, 1854.

with the palette-knife, or what in music would be a fantasia.

From the Asiatic display, more complete by far than any before known, the eye passed to the works of the more disciplined hand and fancy and the more scholastic color-notions of Europe. There was young Munich with Müller's lions and the anti-realistic figures of Schwanthaler; Austria with Monti's veiled heads, henceforth to be credited to Lombardy; Prussia with Rauch; and Denmark with Thorwaldsen—all pure form, copied without color from Nature, from convention and from the antique. Then came design and color united in ceramics—in the marvelously delicate flowers of Dresden, purified in the porcelain-furnace as by fire; in the stately vases of Sèvres, just but varied in proportion, unfathomable in the rich depths of their ground-shadows, and exact and brilliant in the superimposed details; the more raw but promising efforts of Berlin, marked, like the jewelry from the same city, by faithful study of Nature; and, blending the decorative with the economic, the works of the English Wedgwoods and Mintons, infinite in variety of style and utility, and often pleasing in design. Italy, though supplying from her ancient stores so many of the models and so much of the inspiration of the countries named, seems to have forgotten Faenza and Etruria, and to prefer solid stone as a material to preparations of clay and flint. Her Venetian glass has markedly declined, at the same time that glass elsewhere—notably, the stained windows of Munich and the smaller objects of France and Bohemia—shows a great advance in perfection of manufacture and manageability for art purposes.

In that debatable land where the artistic and the convenient meet at the fireside and the tea-table, English invention, enterprise and solicitude for the comfort and presentability of home shone conspicuous. Domestic art finds in the island a congenial home, and helps to make one for the islanders. English interiors, often incongruous and sombre in their decorations, at least produce the always pleasant sensation of physical comfort, the attainment of which the average Briton will class among the fine arts. Lovely as the Graces are, they need a little editing to harmonize them with a coal fire.

This halfway house of the nineteenth century, the house of glass in which it boldly ensconced itself to throw stones at its benighted relations, will ever be a landmark to the traveler over the somewhat arid expanse of industrial and com-

mercial history. Its humblest statistics will be preserved, and coming generations will read with interest that 42,809 persons visited it, on an average, each day, that these rose on one day to 109,915, and that there were at one time in the building 93,224, or six thousand more than Domitian's most tempting and sanguinary bill of theatrical fare could have drawn into the Coliseum. Its length, by the way, was exactly equal to the circumference of the Flavian amphitheatre—1848 feet.

A new home (of progress)! who'll follow? "I," quoth New York. The British empire had taken three years in preparation: New York was ready with less than two. Not quite ready, either, we are apt to say now, but most creditably so for the time and the means of a few enterprising private men bestowed upon it. And for twenty-three years the display of '53 under the Karnak-like shadow of the Croton Reservoir remained unequaled on our soil.

Architecturally, the New York building excelled that of London, and showed itself less cramped by the peculiarities of the novel material. The form was that of a Greek cross, with a central dome a hundred and forty-eight feet high, and eight towers at the salients of seventy feet. The space, including galleries, did not reach a third of that afforded by its prototype, but proved equal to the demand.

Considering the absence of any formal public character in the movement and the brief notice, foreign exhibitors came forward in tolerable force. They could not expect to address through this display each other's commercial constituencies, as very few visitors would traverse the Atlantic: they could reach only the people of the United States. This difficulty must interfere—though much less now than twenty years ago, when the means of ocean-travel were but a fraction of what they are at present—with the international complexion of any exposition in this country. But the question is, after all, one of degree. The country furnishing the site will always furnish the greater part of the display. The rest have to make up in quality for their comparative shortcomings in quantity. The more careful selection thus induced may make distance in some sort an advantage. The sea-breeze will winnow off the chaff and leave more golden the foreign grain.

What Europe did send to New York sufficed to prove the superiority of our own artisans in such labor-saving contrivances as suited the conditions of the country. The foreign implements and machines were more cumbrous in both complexity and weight of parts than ours. In the finer departments of manufacture, the Gobelin tapestry, the French glass, porcelain and silks, the broadcloths of England and Prussia, and a host of other such articles, could expect no rivalry here. The slender contributions of statuary and paintings hardly sufficed to illustrate the conceded superiority of the Old World in art. Crawford and Powers did very well by the side of the other disciples of the antique, their chief opposition coming from some indifferent plaster-casts of Thorwaldsen's *Twelve Apostles*. In point of popularity, Kiss's spirited melodramatic group of the *Amazon and Tiger* threw them all into the shade. Its triumph at London was almost as marked, and the innumerable reductions of it met with everywhere show it to be one of the few hits of modern sculpture.

The general result of the exhibition was to encourage our manufacturers, without giving them a great deal of food for higher ambition; while our artists and the taste of their patrons, actual and possible, were disappointed of the instruction they had reason to expect from the ateliers of Europe, not yet dreaming of the coming flood of American purchasers.

The succeeding years present us with an epidemic of expositions, most of them, often on the slenderest grounds, arrogating the title of "international." The sprightly little city of Cork was one year ahead of New York. Then came Dublin in '53, Munich in '54, Paris in '55, Manchester in '57 (of art exclusively,

and very brilliant), Florence in '61, London again in '62, Amsterdam in '64; and in '65 the mania had overspread the globe, that year witnessing exhibitions dubbed "international" in Dublin, New Zealand, Oporto, Cologne and Stettin, with perhaps some outliers we have missed. Then ensued a lull or a mitigation till the moribund empire of France and the remodeled empire of Austro-

MANCHESTER EXHIBITION BUILDING, 1857.

Hungary flared up into the magnificent demonstrations of '67 and '73. To these last we shall devote the remainder of this article, with but a glance at the second British of 1862.

This, held upon the same ground with its forerunner of eleven years previous, affords a better measure of progress. It developed a manifest advance in designs for ornamental manufactures. The schools of decorative art were beginning to tell. Carpets, hangings, furniture, stuffs for wear, encaustic tiles, etc. showed a sounder taste; and this in the foreign as well as the British stalls. French porcelain was more fully represented than before, and in finer designs. The Paris exhibition of '55, more extensively planned, though less of a financial success, than the London one it followed, was not without effect on the industry and art-culture of France. The United States also showed that they had not been idle. Our fabrics of vulcanized rubber and sewing-machines were boons to Europe she has not been slow to seize. The latter are now sold in England, with trifling modifications and new trade-marks, at from one-third to one-half the price our people have to pay.

The secret of making money out of these great fairs seemed to have been lost. Although England's second took in much more than the first, and four times as much as the first French, four hundred and sixty thousand pounds having entered its treasury, it failed to leave any such profitable memorials of profit.

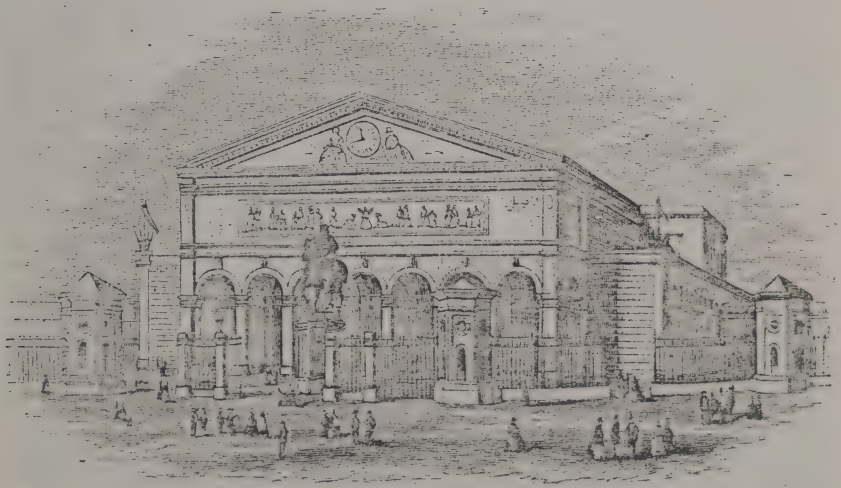
By this time the spirit of French emulation was stirred to its inmost depths. They had gone to London, argued the Gauls, under every disadvantage. To prove that they had returned covered with glory, they hunted every nook and corner of numerical analysis. Out of 18,000 exhibitors of all nations, they had

had but 1747, and yet Paris had received thirty-nine council medals, or honors of the first order, per million of inhabitants, against fourteen per million accorded to London. She had beaten the metropolis of fog not only in general, but in detail. In every branch, from the most solid to the most sentimental, she was victorious. For machinery a million of gamins beat a million of Cockneys in the proportion of seven to six; in the economical and chemical arts, four to one; in the geographical and geometrical, eight to three; and in the fine arts, Waterloo was reversed to the tune of twenty to four.

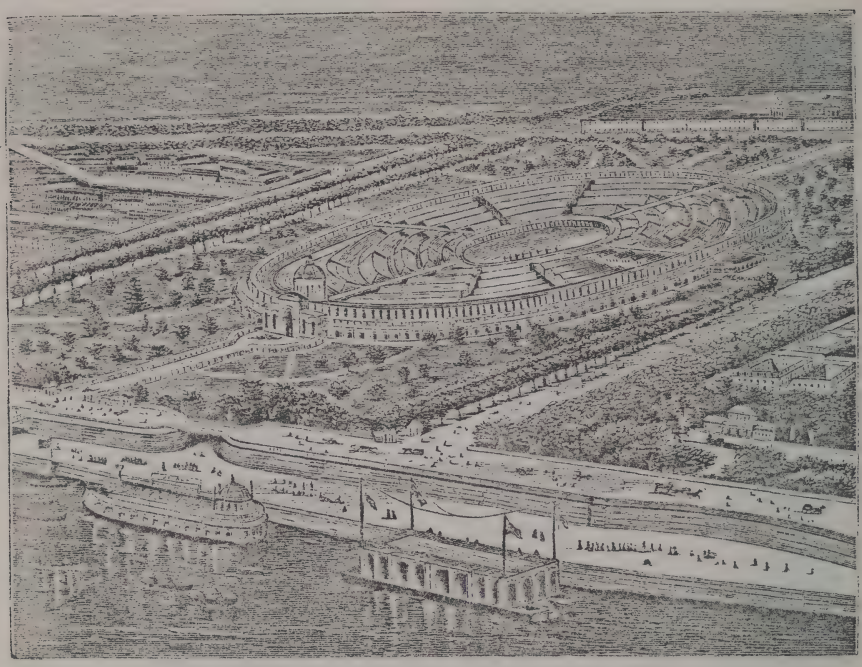
Nothing could be more conclusive; but to take a bond of fate it was determined to imitate England in trying a second display, and supplement '53 with '67 more effectively than Albion had '51 with '62. In what gallant style this determination was carried out we all remember. France did put forth her strength. She illustrated the Second Empire with an outpouring of her own genius and energy the variety and comprehensiveness of which no other nation could pretend to equal; and she called together the nearest approach to a rally of the nations that had yet been seen.

The casket of these assembled treasures was hardly worthy of them, so far as the effect of the mass went. It needed a façade as badly as does a confectioner's plum-cake. Had the vitreous mass been dumped upon the Champs de Mars from the clouds in a viscous state like the Alpine *mers de glace*, it would have assumed much such a thick disk-like shape as it actually wore. Then decorate it with some spun-sugar pinnacles and some flags of silver paper, and the confiseur stood confessed. Nevertheless, motive was there. Catch anything French without it.

The pavilion consisted of seven concentric ovals, the arcs and their radii effecting the duplicate division of objects and countries. Outside, under the eaves and in the surrounding area, the peoples were encamped around their possessions. The gastric fluid being the universal solvent, the festive board was assigned the position nearest the building, a continuous shed protecting the restaurants of all nations, each with its proper specialty in the way of viands and service. Necessarily, there was in the carrying out of the latter idea a good deal of the sham and theatrical. But that gave the thing more zest, and the saloons were by no means the least effective feature of the appliances for introducing the races to each other. Tired of the tender intercourse of chopsticks, forks and fingers,



FLORENCE EXHIBITION BUILDING, 1861.



PARIS EXPOSITION BUILDING AND GROUNDS, 1867.

they could exchange visits in their drawing-rooms; most of the known styles of dwelling-place, if we except the snow-huts of the Esquimaux, the burrows of the Kamtchadales and the boats of Canton, having representatives.

The United States government took particular interest in this exposition, and published a long and detailed report made by its commissioners. Our contributions were not worthy of the country, and showed but little novelty. Implements of farming and of war, pianos, sewing-machines and locomotives attracted chief attention. The pianos were "unreservedly praised." The wines, California having come to the rescue, were pronounced an improvement on previous specimens. The only trait of our locomotives that was admired or borrowed appears to have been that which had least to do with the organism of the machine—the cab. In cars our ideas have fruited better, and Pullman and Westinghouse have gained a firm foothold in England, with whose endorsement their way is open across the Channel. In the arts we are credited with seventy-five pictures, against a hundred and twenty-three from England and six hundred and fifty-two from France.

Here France was at home, and felt it. The works of Dubray, Triquetti, Yvon, Giraud, Gérôme, Dubufe, Toulmouche, Courbet, Troyon, Rosa Bonheur and others exhibited the route toward the naturalistic taken by her modern school, so different from that pursued by the Pre-Raphaelites in England. The Düsseldorf school has been drawn into the same path—France's one conquest from Prussia, who made at the same time a stout struggle in defence of the classic manner through Kaulbach. The drawings and paintings of art-students maintained by the French government in Italy attested an enlightened liberality other governments, general or local, would do well to imitate. The cost of supporting a few score of pupils in Rome could in no way be better bestowed for the promotion of commerce, manufactures and education. Taste has unquestionably a high economic value. But this is only one

of France's ways of recognizing the fact. The government École des Beaux Arts at Paris contained, in 1875, a hundred and seventy-two students of architecture, a hundred and eighty-three of painting, forty of sculpture and two hundred and fifty of engraving.

As a corollary to this assiduous culture, French art collectively was at the exposition "first, and the rest nowhere." The old works sent by Italy stood by themselves; and in mosaic, Salviati's glass, and statuary led by Vela's *Last Moments of Napoleon*, the modern studios of that country ranked in the front. Prussia had some heliographic maps, then a new thing, and chromos, also in the bud; Austria and England, fine architectural drawings; and Eastlake, Stanfield, Landseer, Frith and Faed crossed pencils with the French. But nothing modern of the kind could stand by the porcelain of Sèvres, the glass of St. Louis and Baccarat, the bronzes of other French producers, the vast collection of drawings of ancient and mediæval monuments and architecture in France, her bookbinding and illustration by Bida and Doré, her jewelry and her art-manufactures as a whole. In carriages she had obviously studied the turnouts of American workshops to advantage.

In agricultural machinery all civilized exhibitors had gone to school to our artisans.

One of our specialties, a postal-car, appeared under the Prussian flag. So did things more legitimately the property of the nascent empire. The Krupp gun cast its substance, as well as its shadow, before. A locomotive destined for India made Bull rub his eyes. Chemicals in every grade of purity spoke the potency of the German alembic.

The probability that the production of beetroot-sugar would before many years attain a position among the industries of this country gave interest in the eyes of American visitors to the display of European machinery employed so successfully in that business. Labor-saving machinery we have not generally been in the habit of borrowing. Neither, on the other hand, has Europe been accustomed to draw from us crude material for the finest manufactures; and the balance was set even by the admirable quality of the glass made from American sand and the porcelain moulded in American kaolin. The latter substance, a silicate of alumina, is not found in England, and at but few points on the Continent. We have it in abundance and of the finest quality.

GRAND VESTIBULE OF THE PARIS EXPOSITION BUILDING, 1867.

VIENNA EXPOSITION BUILDING AND GROUNDS, 1873.

The extraordinary steps made within five years in the arts of destruction were illustrated by the twelve-inch Armstrong rifles of England and the Essen gun, throwing a 1212-pound shot. In 1862 the heaviest projectile shown did not exceed one hundred pounds. For field-service the limit of practice in weight seems long ago to have been reached: for forts and ships it cannot be far off. Armor and projectiles must soon bring each other to a standstill; as when, in the Italian wars of the fifteenth century, offence and defence reached the *reductio ad absurdum* of the incapacity of men-at-arms to inflict serious injury upon each other, or even to pick themselves up when the weight of their armor, with some aid from the clumsy blows of an antagonist, had overthrown them. Assailant and assailed were *in equilibrio*, and personal equilibrium could not be restored. Some such inane result may be witnessed when a pair of hostile iron-clads, out of sight of their nursing convoys, shall meet alone upon the deep; with the disagreeable difference that they will, if they go down, have a great deal farther to fall than the cuirassiers of the land.

Since 1851 a new commercial cement had come into operation in the adoption by neighboring powers of the French metrical system. England and America still hold out against the mètre and the gramme; and the press of both occasionally levels at it the old jokes of making the spheres weigh a pound of butter and the polar axis measure a yard of calico. With the innovation, however, our merchants have become perforce familiar, a large share of their imported commodities being invoiced in accordance with it. Its immense superiority to our complicated and arbitrary weights and measures, in the tables whereof the same word often has half a dozen meanings, is beyond argument. In the United States it has earned a quasi-official adoption, but the force of habit among the people has yet to be overcome.

We may here give, in evidence of the increasing hold these expositions have upon the popular mind, the gradual multiplication of the numbers exhibiting. At

London, in '51, the exhibitors were 13,937; at Paris, '55, 23,954; at London, '62, 28,653; and at Paris, '67, 50,226.

Austria, with admirable sp rit, determined to anticipate her turn to enter the lists of peace. Undismayed by Solferino and Sadowa, she had found her Antæus in Andrassy. Her capital city was advancing with immense strides in beauty and extent. Geographically and ethnically it was, like the empire itself, a meeting-ground of north and south, east and west. Isolated from the sea, it offered for the transport of heavy articles a system of railways proved by the event to be sufficiently effective. It was decided that the march of progress should be more than kept up, and that the building, with its appendages, should be an improvement on all its predecessors in extent, in architectural effect and in solidity of material. The dimensions are so variously stated, owing largely to difference of opinion as to what should be embraced within the admeasurement, that we are at a loss how to give them. To the main building, however, was assigned a capacity of seventy-three thousand five hundred and ninety-three square mètres. Sixty-three hundred and eighty of these were awarded to France, ten mètres less to England; and thirteen hundred and sixty to the United States. The marquee-like rotunda rose to a height of two hundred and fifty feet, with a diameter at base of three hundred and fifty-four. The principal entrance, with piers and arches of cut stone profusely decorated with statues and reliefs, was in highly satisfactory contrast to the fragile shells of glass and cast iron that sheltered the earlier exhibitions.

Perhaps in all this solid work the demands of time had not been duly considered. Certainly, the display was not punctual to the appointed period of opening. Exceptionally bad weather was another drawback, and the greed of the Viennese hotel-keepers a third. For such, among other reasons, the enterprise was financially a failure—a fact which little concerns those who went to study and learn, and those who three years later have to describe. If the darken-

ROTUNDA OF THE VIENNA EXPOSITION BUILDING, 1873.

ing of the imperial exchequer prove more than a passing shadow, and an ultimate loss on the speculation cease to be matter of question, the few millions it cost may be recovered by the disbanding of a regiment or two. For one brigade, out of half a million soldiers, to bring the world and its wealth to the seat of government, is doing better than the usual work of the bayonet.

The country and the city themselves were a study to foreigners in many of the modes of life. The extent to which the utilization, as stationary and locomotive machines, of pigs, cows, women and dogs was carried elicited constant remark from the Western tourists, with sundry moral conclusions perhaps too hastily arrived at. This outside feature of the exposition served as an admonition to put our own surroundings in order. They are not apt to expose us to such comments as naturally occur to those who have never seen dogs and damsels in harness together; but other vulnerable points may peradventure be descried. We must demonstrate our civilization to be complete at all points, and not simply a coddled exotic under glass. What if our Viennese guests, physically a stouter race than we, should pronounce our women *too* obviously not hod-carriers, and painfully unaccustomed to wheeling anything heavier than an arm-chair or a piano-stool?

In that land of music concerts could not fail to be a leading feature. The Boston improvement of emphasizing the bass with discharges of distant artillery, or its equivalent, the slamming of cellar-doors nearer by, was not attained. Noise and harmony were kept at arm's length apart.

The illustration of homes was made a specialty. As at Paris, the peoples brought their dwellings, or, more often, the dwellings came without their occupants. The four-footed and feathered live-stock were of more indubitable authenticity. The display of all the European breeds of cattle and horses—English Durhams, Alderneys and racers, Russian trotters, Holstein cows and Flemish mares, the gray oxen of Hungary and the buffaloes of the Campagna, the wild red pigs of the Don and the razor-backs of Southern France—was calculated to amuse, if but moderately to edify, our breeders of Ohio, Kentucky and New York. A thousand horses and fifteen hundred horned cattle comprised this congress, while two hundred and fifty pigs were deemed enough to represent the grunters of all nations.

Of animals in another form, the preserved meats of Australia, sent sound across the tropics to the amount of seventeen thousand tons in 1872, against *four* tons in 1866, had their use of instruction to our packers. So with the improved display of agricultural produce from Southern Russia, our chief competitor in the grain-market. Our reapers and threshers are supplanting, in Eastern Europe, the ridiculous flails, sickles and straight-handled scythes that figured at New York in 1853. We have sent the Dacians, Huns and Sarmatians weapons to cut our own commercial throats. There are more enriching articles of export than wheat, as we must continue to learn.

In turning to other provinces, we find that England was foremost in machinery, the United States, "the only rival," says a British critic, "from whom we had anything to fear," being feebly represented, as we were in other respects, thanks to certain irregularities in the management of our commissioners sufficiently discussed at the time. The British carpets outshone the display of any competitor, the influence of her new schools of decorative design being unmistakably marked.

The Aubusson carpets of France still maintained their position, as did the velvet, faïence, tapestry, engravings, books, marine photographs, etc. of the same country. Italy made her usual contribution in the arts. Among the Austrian objects of this class the opals of Hungary were prominent.

India was unexpectedly complete in her collection: not only her modern industry, but her antiquities, had abundant specimens.

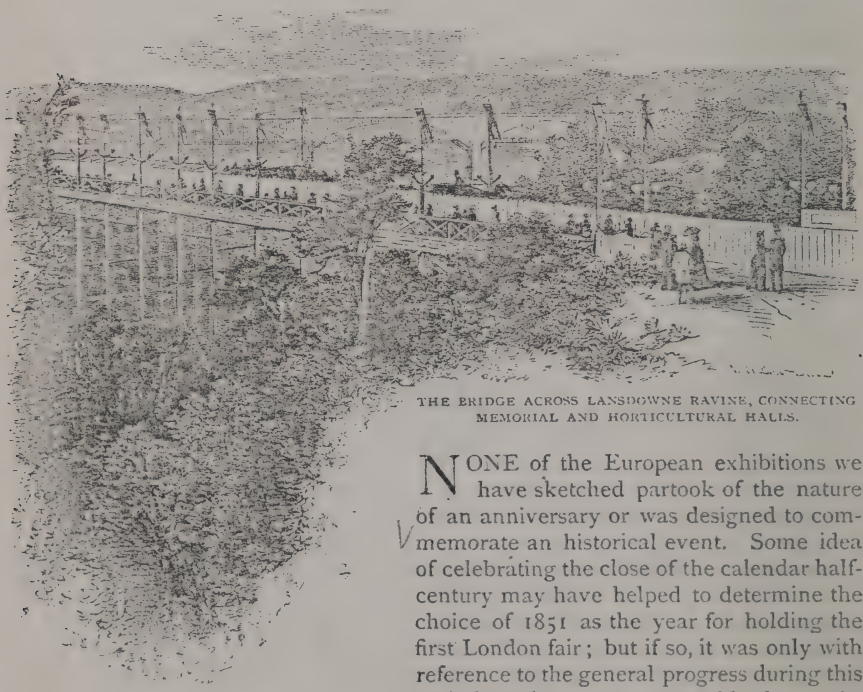
Much criticism has been expended upon the alleged lavish and indiscriminate distribution of medals and diplomas at Vienna. But, however numerous

the undeserving who obtained them, the deserving must at the same time have had their share: the shower that fell on the unjust could not have missed the just. Therefore we note that, despite our slender show, one hundred-and seventy-eight medals for Merit and sixty-nine for Progress, two for the Fine Arts (German Bierstadt and French Healey) and five for Good Taste, came to America. The National Bureau of Education, the Lighthouse Board and the State of Massachusetts obtained "Grand Diplomas of Honor" for documents. The like honor was awarded to the city of Boston and the Smithsonian Institution, and to four private exhibitors for the more palpable contributions of tool-making machinery, steam-machinery, mowing-machines and dentistry. This list does not teach us much. The prizes are, unless awarded with the most intelligent and conscientious precision, valuable chiefly as advertisements to the recipients, who can earn, and generally have earned, better advertisements in other shapes.

Thus did the chief powers of Western and Central Europe display their mettle in peaceful tourney. The visor of a young and unknown knight remained to be barred for the fray. He had, like the rest in these days of modern chivalry, to be his own herald and blow his own preliminary blast. It was a tolerably sonorous one; but he did not forget the need of proving that he could speak through better things than brass.

PART IV.

THE CENTENNIAL EXPOSITION UNDER ROOF.



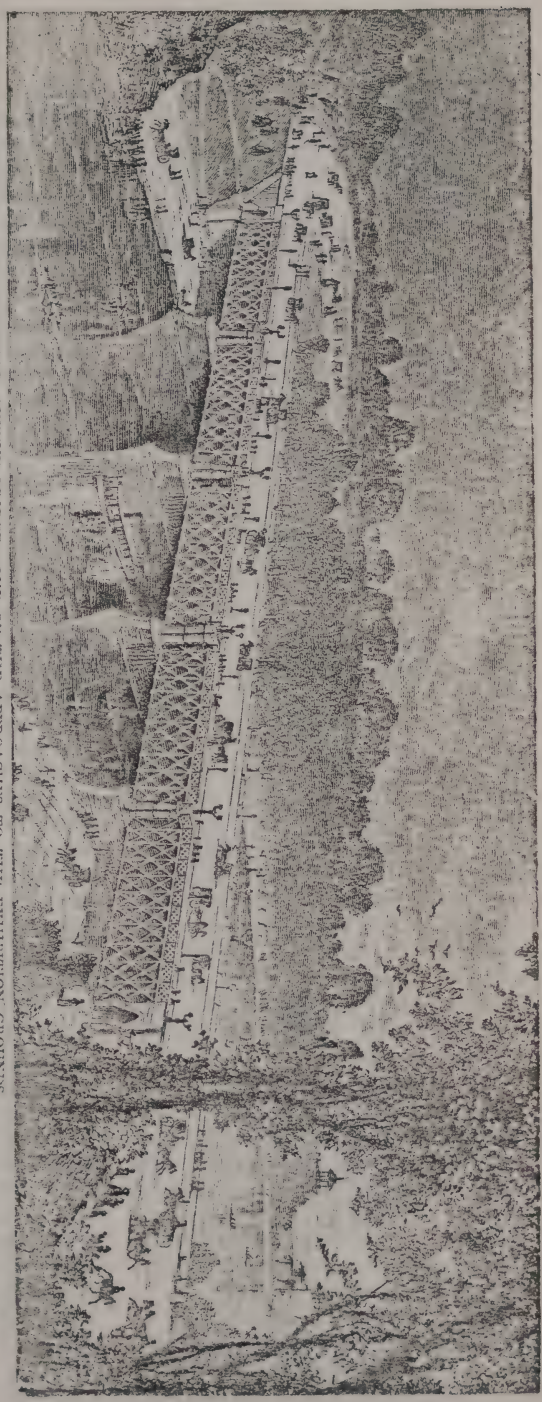
THE BRIDGE ACROSS LANSDOWNE RAVINE, CONNECTING MEMORIAL AND HORTICULTURAL HALLS.

NONE of the European exhibitions we have sketched partook of the nature of an anniversary or was designed to commemorate an historical event. Some idea of celebrating the close of the calendar half-century may have helped to determine the choice of 1851 as the year for holding the first London fair; but if so, it was only with reference to the general progress during this period, and not to any notable fact at its commencement. Still less did the later exhibitions owe any portion of their significance and interest to their connection with a date. They afforded occasion for comparison and rivalry, but no shape loomed up out of the past claiming to preside over the festival, to have its toils and achievements remembered, and to

be credited with a share in the production of the harvests garnered by its successors.

In our case it is very different. Here was the birth-year of the Union coming apace. It forced itself upon our contemplation. It appealed not merely to the average passion of grown-up boys for hurrahs, gun-firing, bell-ringing, and rockets sulphureous and oratorical. It addressed us in a much more sober tone and assumed a far more didactic aspect. Looking from its throne of clouds o'er half the (New) World — and indeed, as we have shown, constructively over the Old as well — it summoned us to the wholesome moral exercise of pausing a moment in our rapid career to revert to first principles, moral, social and political, and to explore the germs of our marvelous material progress. Nor could we assume this office as exclusively for our own benefit. The rest of Christendom silently assigned it to the youngest born for the common good. Circumstances had placed in our hands the measuring-rod of Humanity's growth, and all stood willing to gather upon our soil for its application, so far as that could be made by the method devised and perfected within the past quarter of a century. It was here, a thousand leagues away from the scene of the first enterprise of the kind, that the culminating experiment was to be tried.

To what point on a continent as broad as the Atlantic were they to come? The



GIRARD AVENUE BRIDGE—ONE OF THE APPROACHES TO THE EXHIBITION GROUNDS.

European fairs were hampered with no question of locality. That Austria should hold hers at Vienna, France at Paris, and Britain at London, were foregone conclusions. But the United States have a plurality of capitals, political, commercial, historical and State. Washington, measured by house-room and not by magnificent distances, was too small. New York, acting with characteristic haste, had already indulged in an exposition, and it lacked, moreover, the rich cluster of associations that might have hallowed its claims as the "commercial metropolis." Among the State capitals Boston alone had the needed historical eminence, but, besides the obvious drawback of its situation, its capacity and its commissariat resources, except for a host of disembodied intellects, must prove insufficient. There remained the central city of the past, the seat of the Continental Congress, of the Convention and of the first administrations under the Constitution which it framed—the halfway-house between North and South of the early warriors and statesmen, and the workshop in which the political machinery that has since been industriously filed at home and more or less closely copied abroad was originally forged. Where else could the two ends of the century be so fitly brought together? Here was the Hall of 1776; the other hall that nearly two years earlier received the first assemblage of "that hallowed name that freed the Atlantic;" the modest building in a bed-chamber of which the Declaration of Independence was penned; and other localities rich with memories of the men of our heroic age.

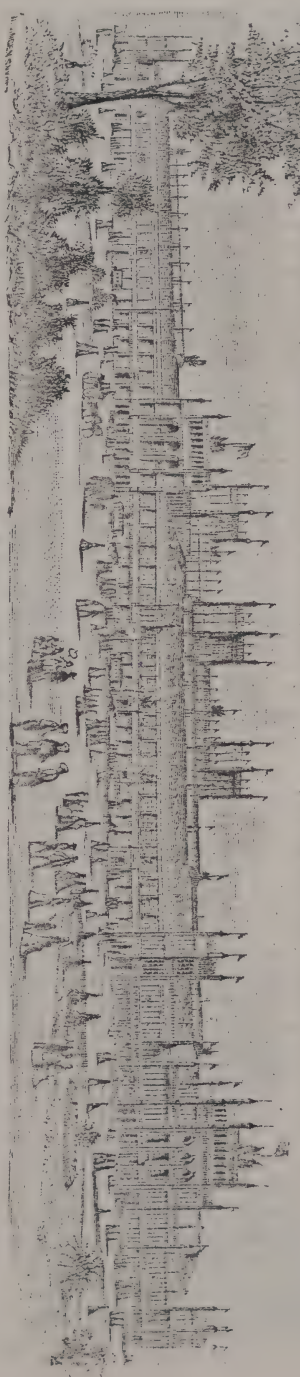
The space of a few blocks covered the council-ground of the Union. Those few acres afforded room enough for the beating of its political heart for twenty-five years, from the embryonic period to that of maturity—from the meeting of a consulting committee of subject colonists to the establishment of unchallenged and symmetrical autonomy.

The growth of Philadelphia from this contracted germ was only less remarkable than that of the government. The capital of the provincial rebels had expanded into one fit for an empire, comparable to Vienna as a site for a World's Exposition and a caravanserai for those who should attend it. Such advantages would have caused its selection had the question been submitted in the first instance to the unbiased vote of various quarters of the Union, all expected and all prepared to contribute an equal quota, according to population and means, of the cost. But the enterprise of the community itself anticipated such decision. Its own citizens hastened to appropriate the idea and shoulder the responsibility. They felt that the standpoint wherefrom they were able to address their countrymen was a commanding one, and they lost no time in lifting up their voice. Aware that those who take the initiative have always to carry more than their share of the burden, they were very moderate in their calls for aid; and the demand for that they rested chiefly upon the same ground which naturally sustained part of their own calculations of reimbursement in some shape, direct or indirect — local self-interest. The dislike to the entire loss of a large outlay on an uncertain event is not peculiar to this commercial age. Appeals on the side of patriotism and of public enthusiasm over the jubilee of a century would be at least as effective with the American people as with any other in the world; but they could not be expected to be all-powerful, and to need no assistance from the argument of immediate and palpable advantage. In default of subscriptions to the main fund from distant towns and States, these were invited to provide for the cost of collecting, transporting and arranging their individual shares of the display. This they have generally, and in many cases most liberally, done, in addition to direct subscriptions greater in amount than the provinces of either Austria, France or England made to their respective expositions. Withal, it could surprise no one that Pennsylvania and her chief city would have to be the main capitalists of an undertaking located on their own soil.

These came forward with a promptness that at once raised the movement

above the status of a project. The city with a million and a half, and the State with a million, replenished the exchequer of the association after a fashion that ensured in every quarter confidence in its success, and at the same time extinguished what little disposition may have been manifested elsewhere to cavil at the choice of location. These large subventions very properly contemplated something more than the encouragement of a transient display, and were for the most part devoted to the erection of structures of a permanent character, such as the Art-Gallery or Memorial Hall and the Horticultural Building. To endowments of this description, called forth by the occasion, we might add the Girard Avenue Bridge, the finest in the country, erected by the city at the cost of a million and a half, and leading direct to the exhibition grounds. The concession of two hundred and sixty acres of the front of Fairmount Park, with the obliteration of costly embellishments that occupied the ground taken for the new exposition buildings, may be viewed in the light of another contribution.

A treasury meant to accommodate seven millions of dollars—three millions less than the Vienna outlay—still showed an aching void, which was but partially satisfied by the individual subscriptions of Philadelphians. It became necessary to sound the financial tocsin in the ears of all the Union. Congress, States, cities, counties, schools, churches, citizens and children were appealed to for subscriptions. The shares were fixed at the convenient size of ten dollars each, hardly the market-value of the stock-certificate, "twenty-four by twenty inches on the best bank-note paper," which became the property of each fortunate shareholder on the instant of payment. But these seductive pictures belonged to a class of art with which the moneyed public had become since '73 unhappily too familiar. They had to jostle, in the gallery of the stock-market, a vast and various collection exhaustive of the whole field of allegory, mythological and technical, and framed in the most bewitching aureoles of blue, red and green printer's



MAIN BUILDING.

ink. It seemed in '72 much more probable that the Coon Swamp and Byzantium Trans-Continental Railway would be able, the year after completion, to pay eight per cent. on fifty thousand dollars of bonds to the mile, sold at seventy in the hundred, than it did in '75 that ten millions of fifty-cent tickets could be disposed of in six months at any point on the Continent. Thus it happened that the exchange of Mr. Spinner's twenty square inches of allegory for the three square feet of Messrs. Ferris & Darley's went on slowly, and it became painfully obvious that the walls of but an imperceptible minority of American homes would have the patriotic faith and fervor of their occupants attested a century hence by these capacious engravings, as that of a hundred years ago is by rusty muskets and Cincinnati diplomas.

Still, the stock did not altogether go a-begging. The adjacent State of New Jersey signed for the sum of $100,000, more remote New Hampshire and Connecticut for $10,000 each, and little Delaware for the same. Kansas gave $25,000. Five thousand were voted by the city of Wilmington, and a thin fusillade of ten-dollar notes played slowly from all points of the compass. This was kept up to the last, and with some increase of activity, but it was a mere affair of pickets, that could not be decisive.

Undismayed, the managers fought their way through fiscal brake and brier, the open becoming more discernible with each effort, till in February, 1876, Congress rounded off their strong box with the neat capping of a million and a half. The entire cost of administration and construction was thus covered, and the association distinguished from all its predecessors by the assurance of being able on the opening day to invite its thousands of guests to floors laden with the wealth of the world, but with not an ounce of debt.

The assistance extended in another and indirect form by the States collectively and individually was valuable. Congress appropriated $505,000 for the erection of a building and the collection therein of whatever the different Federal departments could command of the curious and instructive. Massachusetts gave for a building of her own, and for aiding the contribution of objects by her citizens, $50,000; New York for a like purpose, $25,000; New Hampshire, Nevada and West Virginia, $20,000 each; Ohio, $13,000; Illinois, $10,000; and other States less sums. The States in all, and in both forms of contribution, donated over four hundred thousand dollars—not a fourth, strange to say, of the sums appropriated by foreign governments in securing an adequate display of the resources, energy and ingenuity of their peoples. It does not approach the donation of Japan, and little more than doubles that of Spain. In explanation, it may be alleged than our exhibitors, being less remote, would encounter less expense, and a larger proportion of them were able to face their own expenses.

Great as is the value to a country of a free and facile interchange of commodities and ideas between its different parts, of not less—under many circumstances far greater—importance is its wide and complete intercourse with foreign lands. Provincial differences are never so marked as national. The latter are those of distinct idiosyncrasies—the former, but modifications of one and the same. To study members of our own family is only somewhat to vary the study of ourselves. Really to learn we must go outside of that circle. Hence the tremendous effect of the world-searching commerce of modern times in the enlightenment and enrichment of the race.

For the best fruits of the exposition its projectors and all concerned in its success looked abroad. In this estimate of highest results they had the example of Europe. It was remembered that British exports rose from one hundred and thirty-one millions sterling in 1850 to two hundred and fourteen in 1853—an increase equal to our average annual export at present, and double what it was at that time. The declared satisfaction of Austria with her apparent net loss of seven millions of dollars by the exhibition of 1873, in view of the offset she claimed in the stimulus it gave to her domestic

industry and the extended market it earned for her foreign trade, was also eloquent. We must therefore address the world in the way most likely to ensure its attention and attendance. The chief essential to that end was that it should be official. Government must address government.

Naturally, this necessity was apparent from the beginning. Congress was addressed betimes, and the consequence was a sufficiently sonorous act of date March 3, 1871, assuming in the title to "provide for celebrating the one hundredth anniversary of American independence." It made, however, no provision at all for that purpose financially. On the contrary, it provided very stringently that the Federal treasury should not be a cent the worse for anything contained in the bill. It furnished, however, the stamp wanted. It "created" the United States Centennial Commission, and it directed the President, as soon as the private corporators should have perfected their work, to address foreign nations, through their diplomatic representatives and our own, in its behalf. A commissioner and alternate were appointed by the President, on the nomination of the respective governors, from each State and Territory, who should have "exclusive control" of the exhibition.

Subsequently, an act of June 1, 1872, established a Centennial Board of Finance, as a body corporate, to manage the fisc of the exhibition, provide ways and means for the construction of the buildings according to the plans adopted by the commission, and after the close of the exhibition to convert its property into cash and divide the same, after paying debts, *pro rata* among the stockholders. This was to be done under the supervision of the commission, which was to wind up the board, audit its accounts, and make report to the President of the financial outcome of the affair. An inroad on the terms of this act was made by the law of Feb., 1876, which makes preferred stock of the million and a half then subscribed by the Federal government—a provision, however, the literal enforcement of which, by the covering back of so much money

MACHINERY HALL.

into the treasury of the United States, was thought less probable than that it would be made a permanent appropriation, in some form, for the promotion of the arts of industry and taste.

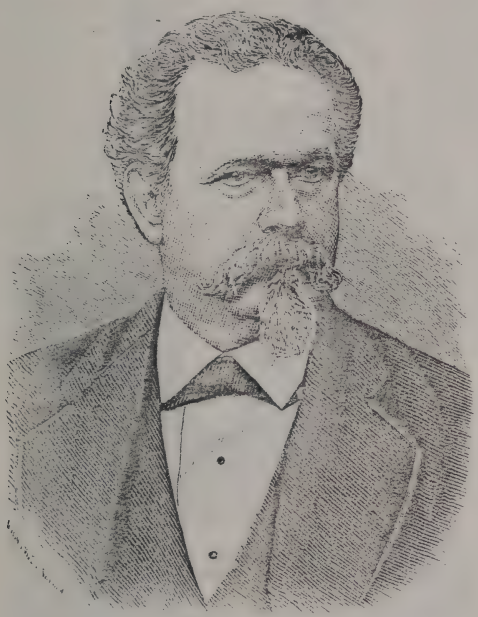
Ten millions of dollars was the authorized capital of the new board. Events have proved the amplitude of this estimate.

As early as the third day of July, 1873, the President was enabled, by the notification of the governor of Pennsylvania, to make formal proclamation that provision had been made for the completion of the exposition structures by the time contemplated. Nearly three years was thus allotted for preparation to home and foreign exhibitors. A year later (June 5, 1874) an act of a single sentence requested the President "to extend, in the name of the United States, a respectful and cordial invitation to the governments of other nations to be represented and take part in" the exposition: "*Provided, however*, that the United States shall not be liable, directly or indirectly, for any expenses attending such exposition, or by reason of the same." The abundant caution of this *italically* emphatic reservation could not preclude the extension to the representatives of foreign governments of such measure of hospitality, on occasion, as they may have in the like case offered our own.

Acts permitting the Centennial medals to be struck at the mint, and admitting free of duty articles designed for exhibition, were passed in June, 1874. The Secretary of the Treasury gave effect to the latter by a clear and satisfactory schedule of regulations. Under its operation foreign exhibitors have all their troubles at home; their goods, once on board ship, reaching the interior of the building with more facility and less of red tape than they generally meet with in attaining the point of embarkation.

The answers of the nations were all that could be desired, and largely beyond any anticipation. Their government appropriations will exceed an aggregate of two millions in our currency. Great Britain, with Australia and Canada, gave for the expenses of her share of the display $250,000 in gold; France, $120,000; Germany, $171,000; Austria, $75,000; Italy, $38,000 from the government direct, and the same sum from the Chamber of Commerce, which is better, as indicating enlightenment and energy among her business-men; Spain, amid all her distractions, $150,000; Japan, an unknown quantity in the calculations of 1851, no less than $600,000; Sweden, $125,000; Norway, $44,000; Ecuador, $10,000; the Argentine Confederation, $60,000; and many others make ample provision not yet brought to figures, among them Egypt, China, Brazil, Chili, Venezuela, and that strange political cousin of ours at the antipodes, begotten and sturdily nurtured by the Knickerbockers, the Orange Free State. In all, we may reckon at forty the governments which have made the affair a matter of public concern, and have ranked with the ordinary and regular cares of administration the interest of their people in being adequately represented at Philadelphia. From many other states considerable displays were gotten up at private expense. It results that there are collected twenty-one acres under roof of the best products of the outer world—more than the entire area of the London exposition of 1851. A Muscovite journal, the *Golos*, expressed a wide popular sentiment in declaring that our exposition "will have immense political importance in the way of international relations." The people suspect they have found what they have long needed—a great commercial, industrial and political 'change to aid in regulating and equalizing the market of ideas and making a common fund of that article of trade, circulating freely and interchangeable everywhere at sight. Practically, the territory of the United States is an island like Great Britain. Everything that comes to Philadelphia, save a little from Canada, will traverse the sea. We are assuming the metropolitan character, whereto isolation is a step. All the imperial centres, old and new, have been seated on islands or promontories. Look at England, Holland, Venice, Carthage, Syracuse, Tyre, Rome and Athens. Shall we add New York and San Francisco—little wards as they are of a continental metropolis?

A unanimous, graceful and cordial bow of acceptance having thus swept round the globe in response to the invitation of the youngest member of the family, let us glance at the preparations made for the comfortable entertainment of so august an assemblage. An impression that its host was not yet fully out of the



HON. JOSEPH R. HAWLEY,
PRESIDENT OF THE CENTENNIAL COMMISSION.

woods, that the chestnut-burs were still sticking in his hair, and that the wolf, the buffalo and the Indian were among his intimate daily chums, may have tended to modify its anticipations of a stylish reception. The rough but hearty ways of a country cousin who wished to retaliate for city hospitalities probably limited the calculations of the expectant world. This afforded the cousin aforesaid opportunity for a new surprise, of which he fully determined to avail himself. It is not his habit to aim too low, and that was not his failing in the present instance.

The edifices, according to the original plan, were to excel their European exemplars not less in elegance and elaboration than in completeness for their practical purposes, in adaptation and in capacity. The uncertainty, however, of success in raising the necessary funds in time enforced the abandonment of much that was merely ornate—a circumstance which was proved fortunate by the excess in the demands of exhibitors over all calculations, since the means it was at first proposed to bestow upon the artistic finish of the buildings were needed to provide additional space. As it is, the architectural results actually attained are above the average of such structures in general effect. The Main Building strikes the eye, at an angle of vision proper to its extent, more pleasingly than either of the English or French structures; while for the massiveness and dignity unattainable by glass and iron Memorial Hall has no rival among them, and its façade is inferior chiefly in richness of detail to the main entrance at Vienna. Were it otherwise, some shortcoming in point of external beauty might be pardoned in erections which are meant to stand but for a few months, and which can have no pretensions to the monumental character belonging to true architecture. Suitability to their transient purpose is the great thing to be considered; and their merit in that regard is amply established. Mr. P. Cunliffe Owen, familiar with all the minutiæ of previous expositions, declares them supreme "in thoroughness of plan and energy of construction"—a judgment designed to cover the whole conception and administration of the exhibition, and one which, coming from a disinterested and competent foreign observer, may be cited as an amply expressive tribute to the zeal and fidelity of those in control. Ex-Governor Hawley of Connecticut, president of the commission, is a native of North Carolina, and brought to the cause a combination of Southern ardor with Northern tenacity. The secretary of the commission, Mr.

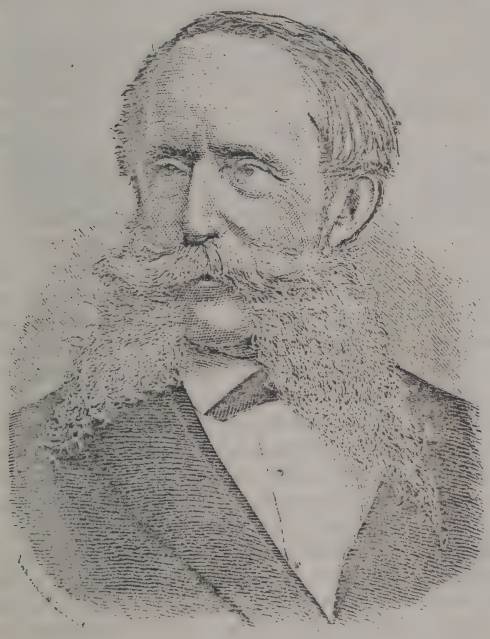
John L. Campbell of Indiana, was a good second in that bureaucratic branch of the management. The trying charge of supervising the work generally, conducting negotiations and correspondence, and leading as one harmonious body to the objective point of success an army of artists, contractors, superintendents, clerks, exhibitors, railroad companies and State and national commissioners, fell to Colonel A. T. Goshorn of Ohio, director-general. We do not know that anything more eloquent can be said of him than simply thus to name what he had to do and point to what he has done. The duties of procuring the ways and means and controlling their expenditure devolved upon the Centennial Board of Finance. Of this body Mr. John Welsh is Chairman; Mr. Frederick Fraley, Treasurer; and Mr. Thomas Cochran, Chief of the Building Committee. Their office was fixed upon the grounds at an early stage of the proceedings. Mr. Welsh, more fortunate than Wren, has been able while yet in the flesh to point to his monument, and see it rising around him from day to day.

GENERAL ALFRED T. GOSHORN,
DIRECTOR-GENERAL OF THE CENTENNIAL COMMISSION.

The exposition was peculiarly fortunate in its site. Had historical associations determined the choice of the ground, the array of them in Fairmount Park would have sufficed to justify that which has been made. Its eminences are dotted with the country-houses of the Revolutionary statesmen and with trees under which they held converse. On one of them Robert Morris, our American Beaumarchais, enjoyed his financial zenith and fell to its nadir. To another the wit and geniality of Peters were wont to summon for relaxation the staid Washington, the meditative Jefferson, Rittenhouse the man of mathematics, the gay La Fayette with enthusiasm as yet undamped by Olmütz, and his fellow-*émigrés* of two other stamps, Talleyrand and the citizen-king that was to be. The house of one of the Penns looked down into a secluded dell which he aptly dubbed Solitude, but which is now the populous abode of monkeys, bears and a variety of other animals, more handsomely housed than any similar collection in America.

Knolls not appropriated by the villas of the old time, or from which they have disappeared, offered admirable locations for some of the buildings of the exposition, and a broad and smooth plateau, situated precisely where it was wanted, at the point nearest the city, offered itself for the largest two, the Main Building and Machinery Hall, with room additional for the Art Building. The amphitheatrical depression flanked on the east by this long wall of granite and glass, and spreading northward to the heights occupied by Horticultural Hall and the Agricultural Building, was assigned to the mushroom city to be formed of the various State and foreign head-quarters, restaurants, the Women's Pavilion, the United States Government Building, that of the press

a monster dairy, a ditto brewery, and a medley of other outcroppings of public and private spirit. To this motley and incoherent assemblage a quiet lakelet nearly in the centre would supply a sorely-wanted feature of repose, were it not to be vexed by a fountain, giving us over bound and helpless to the hurly-burly. But that is what every one will come for. When each member of the congregated world "tries its own expressive power," madness not inappropriately rules the hour. Once in a hundred years a six months' carnival is allowable to so ponderous a body. Civilization here aims to



JOHN WELSH, ESQ.,
PRESIDENT OF THE CENTENNIAL BOARD OF FINANCE.

see itself not simply as in a glass, but in a multitude of glasses. To steer its optics through the architectural muddle in the basin before us it will need the retina that lies behind the facets of a fly.

Eighteen hundred and eighty feet long, four hundred and sixty-four wide, forty-eight to the cornice and seventy to the roof-tree, are figures as familiar by this time to every living being in the United States as pictures of the Main Building. At each corner a square tower runs up to a level with the roof, and four more are clustered in the centre of the edifice and rise to the height of a hundred and twenty feet from a base of forty-eight feet square. These flank a central dome one hundred and twenty feet square at base and springing on iron trusses of delicate and graceful design to an apex ninety-six feet above the pavement—the exact elevation of the interior of the old Capitol rotunda. The transept, the intersection of which with the nave forms this pavilion, is four hundred and sixteen feet long. On each side of it is another of the same length and one hundred feet in width, with aisles of forty-eight feet each. Longitudinally, the divisions of the interior correspond with these transverse lines. A nave one hundred and twenty feet wide and eighteen hundred and thirty-two feet long—said to be unique for combined length and width—is accompanied by two side avenues a hundred feet wide, and as many aisles forty-eight feet wide. An exterior aisle twenty-four feet wide, and as many high to a half-roof or clerestory, passes round the whole building except where interrupted by the main entrances in the centres of the sides and ends and a number of minor ones between.

The iron columns which support the central nave and transept are forty-five feet high, the roof between rising to seventy. Those of the side avenues and transepts are of the same height, with a roof-elevation of sixty-five feet. The columns of the centre space are seventy-two feet high. In all, the columns number six hundred and seventy-two. They stand twenty-two feet apart upon foundations of solid masonry. Being of rolled iron, bolted together in segments, they could, like the other constituents of the building, be taken apart and erected elsewhere when the gentlemen of the commission, their good work done and

the century duly honored, should fold their tents like the Arabs, though not so silently.

A breadth of thirty feet was left to the main promenades, along and athwart, of fifteen feet to the principal ones on either side, and of ten feet to all the others. Narrow highways these for traversing the kingdoms of the world, but, combined, they nearly equal the bottom depth of the Suez Canal, very far exceed the five feet of the Panama Railway, and still farther the camel-track that sufficed a few centuries ago to link our ancestors to the Indies. The berths of the nations ran athwartship, or north and south as the great ark is anchored. The classes of objects were separated by lines running in the opposite direction. Noah may be supposed to have followed some such arrangement in his storage of zoological zones and families. He had the additional aid of decks; which our assemblers of the universe declined, small balconies of observation being the only galleries of the Main Building. Those at the different stages of the central towers proved highly attractive to students who prefer the general to the particular, or who, exhausted for the time, retire to clear their brains from the dust of detail and muster their faculties for another charge on the vast army of art. From this perch one might survey mankind from China to Peru through "long-drawn aisles" flooded with mellow light, the subdued tones of the small surface that glass leaves open to the paint-brush relieved with a few touches of positive color to destroy monotony. These are assisted by the colored glass louvres, which have no other artistic merit, but serve, where they are placed over the side-entrances, to indicate the nation to whose department belongs that particular vomitorium.

Four miles of water- and drainage-pipe underlie the twenty-one and a half acres of plank floor in this building. The pillars and trusses contain thirty-six hundred tons of iron. The contract for it was awarded in July, 1874, and it was completed in eighteen months, being ready for the reception of goods early in January last. The cost was $1,420,000, and in mechanical execution the iron-, glass- and wood-work was pronounced fully equal to either of the British structures and superior to those of the Continent. In economy of material for producing a given result it is probable that the iron trusses and supports of the English buildings are as much excelled as the iron bridges of this country surpass those of Great Britain in the combination of lightness with strength. Our metal is better, and its greater cost has united with the scarcity of labor which so stimulated ingenuity in other departments of industry to enforce tenuity of form. Foreign engineers wonder that our viaducts stand, but somehow they do stand.

The turrets and eagles of galvanized sheet iron, not being intended to support anything but jokes, need not be criticized as part of the construction. The tiled pavements of the vestibules, designed to sustain, besides criticism of the he-who-walks-may-read order, the impact of the feet of all nations, are more important. Their pattern is very fair—their solidity not beneath the occasion. The turf and shrubbery meant to brighten the *entourage*, especially at the carriage concourse on the east front, had to brace itself against a similar trial. The defence of their native soil, to prevent its being rent from them by the heedless tread of millions and scattered abroad in the shape of dust, was a call upon the untiring struggles of the guardian patriots in the Centennial police service.

Shall we step northward from the middle of this building to Memorial Hall, or thread the great nave to the western portal and enter the twin tabernacle sacred to Vulcan? The answer readily suggests itself: substantials before dessert—Mulciber before the Muses. Let us get the film of coal-smoke, the dissonance of clanking iron and the unloveliness of cog-wheels from off our senses before offering them to the beautiful, pure and simple. We come from the domain of finished products, complete to the last polish, silently self-asserting and wooing the almighty dollar with all their simpers. We pass to their noisy hatching- and training-ground, where all the processes

of their creation from embryo to maturity are to be rehearsed for our edification. We shall here become learned in the biography of everything a machine can create, from an iron-clad to a penknife or a pocket-handkerchief. In the centre of the immense hall, fourteen hundred and two by three hundred and sixty feet and covering fourteen acres, the demiurgos of this nest of Titans, a double engine of fourteen hundred horse-power, but capable of being worked much higher—is getting together its bones of cast and thews of wrought iron, and

AGRICULTURAL BUILDING.

seems already like the first lion "pawing to be free." Its first throb one would fancy inevitably fatal to the shell of timber and glass that surrounds it.

Before it is brought to the test let us explore that shell. To our eye, its external appearance is more pleasing than that of the building we just left. The one central and four terminal towers, with their open, kiosk-like tops, are really graceful, and the slender spires which surmount them are preferable to the sham of sheet-iron turrets. Thanks, too, to the necessity of projecting an annex for hydraulic engines from one side of the middle, the building is distinguished by the possession of a front. The main cornice is forty feet in height upon the outside; the interior height being seventy feet in the two main longitudinal avenues and forty feet in the one central and two side aisles. The avenues are each ninety feet in width, and the aisles sixty, with a space of fifteen feet for free passage in the former and ten in the latter. A transept ninety feet broad crosses the main building into that for hydraulics, bringing up against a tank sixty by one hundred and sixty feet, whereinto the waterworks shall precipitate, Versailles fashion, a cataract thirty-five feet high by forty wide.

The substitution of timber for iron demands a closer placing of the pillars. They are consequently but sixteen feet apart "in the row," the spans being correspondingly more contracted. This has the compensating advantage, æsthetically speaking, of offering more surface for decorative effect, and the opportunity has been fairly availed of. The coloring of the roof, tie-rods and piers expands over the turmoil below the cooling calm of blue and silver. To this the eye, distracted with the dance of bobbins and the whirl of shafts, can turn for relief, even as Tubal Cain, pausing to wipe his brow, lifted his wearied gaze to the welkin.

Machinery Hall illustrated, from its earliest days, the process of development by gemmation. Southward, toward the sun, it shot forth several long and lusty sprouts. The hydraulic avenue which

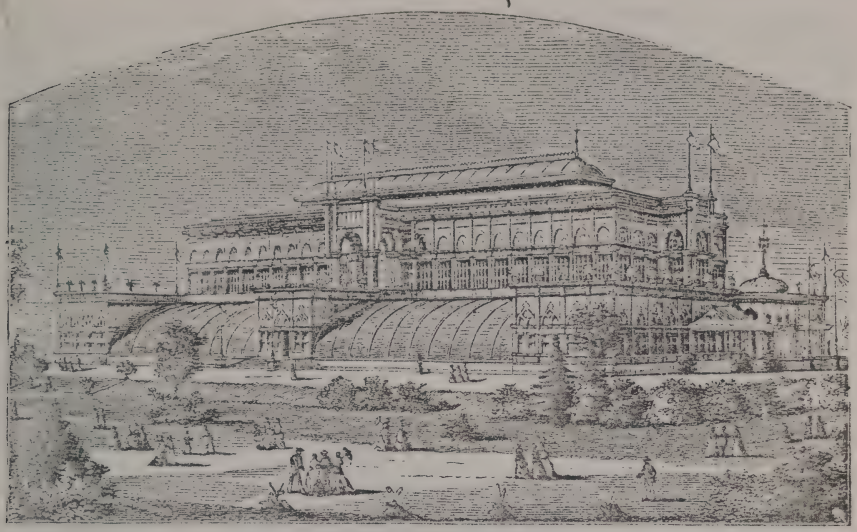
we have mentioned covers an acre, being two hundred and eight by two hundred and ten feet. Cheek by jowl with water is its neighbor fire, safe behind bars in the boiler-house of the big engine; and next branches out, over another acre and more, or forty-eight thousand square feet, the domain of shoes and leather under a roof of its own.

Including galleries and the leather, fire and water suburbs, this structure affords more than fifteen acres of space. Over that area it rose like an exhalation in the spring and early summer of 1875. At the close of winter it existed only in the drawings of Messrs. Pettit & Wilson. Under the hands of Mr. Philip Quigley it was ready to shelter a great Fourth of July demonstration. This matches the rapidity of growth of its neighbor before described. The Main Building, designed by the same firm, had its foundations laid by Mr. R. J. Dobbins, contractor, in the fall of 1874, but nothing further could be done till the following spring. The first column was erected, an iron Maypole, on the first day of the month of flowers, and the last on the 27th of October. Three weeks later the last girder was in place. All had been done with the precision of machinery, no pillar varying half an inch from its line. Machinery, indeed, rolled the quadrant-shaped sections of each column and riveted their flanges together with hydraulic hammers; great steam-derricks dropped each on its appointed seat; and the main tasks of manual labor in either building were painting, glazing, floor-laying and erecting the ground-wall of masonry, from five to seven feet high, that fills in the outer columns all round to a level with the heads of theorists who, holding that *la propriété c'est le vol*, assert the propriety of theft.

Following Belmont Avenue, the Appian Way of the Centennial, to the north-west, we penetrate a mob of edifices, fountains, restaurants, government offices, etc., and reach the Agricultural Building — the palace of the farmer. The hard fate of which he habitually complains—that of being thrust into a corner save when he is wanted for tax-paying purposes—does not forsake him here. The commission does not tax him, however, and the boreal region whereto he and his belongings are consigned is in no other way objectionable than as not being nearer the front. The building was worthy of a Centennial agricultural fair. Five hundred and forty by eight hundred and twenty feet, with ten acres and a quarter under roof, it equalled the halls of a dozen State cattle-shows. The style is Gothic, the three transepts looking like those of as many cathedrals stripped of the roof, the extrados taking its place. The nave that spits them is a hundred and twenty-five feet wide, with an elevation of seventy-five feet. An ecclesiastical aspect is imparted by the great oriel over the main entrance, and the resemblance is aided by a central tower that suggests the "cymbals glorious swinging uproarious" in honor of the apotheosis of the plough. The materials of this bucolic temple are wood and glass. The contract price was $250,000. Its contents proved more cosmopolitan than could have been anticipated when it was planned. Germany claimed five thousand feet and Spain six thousand. Among other countries, tropical America was fully represented.

Besides this indoor portion of the world's farm-steading, a barnyard of correspondent magnitude was prepared, where all domestic animals could be accommodated, and the Wiers, Landseers and Bonheurs might find many novelties for the portfolio. A race-track, too, was an addendum of course. What would our Pan-Athenaic games be without it?

From this exhibition of man's power over the fruits of the earth and the beasts of the field we cross a ravine where the forest is allowed to disport itself in ignorance of his yoke, and ascend another eminence where floral beauty, gathered from all quarters of the globe, is fed in imprisonment on its native soil and breathes its native climate. Early visitors predicted that woman would seek her home among the flowers on the hill rather than in the atelier specially prepared for her in the valley we have passed. Her tremendous struggles through the mud, while yet the grounds were all chaos, to get sight of



HORTICULTURAL HALL.

the first plants that appeared in the Horticultural Building, left no doubt of this in our mind.

No site could have been more happily chosen for this beautiful congress-hall of flowers. It occupies a bluff that overlooks the Schuylkill a hundred feet below to the eastward, and is bounded by the deep channels of a pair of brooks equidistant on the north and south sides. Up the banks of these clamber the sturdy arboreal natives as though to shelter in warm embrace their delicate kindred from abroad. Broad walks and terraces prevent their too close approach and the consequent exclusion of sunlight.

For the expression of its purpose, with all the solidity and grace consistent with that, the Moresque structure before us is not excelled by any within the grounds. The curved roofs of the forcing-houses would have the effect upon the eye of weakening the base, but that, being of glass and showing the greenery within, their object explains itself at once, and we realize the strong wall rising behind them and supporting the lofty range of iron arches and fretwork that springs seventy-two feet to the central lantern. The design of the side portals and corner towers may be thought somewhat feeble. They and the base in its whole circuit might with advantage have been a little more emphasized by masonry. The porticoes or narrow verandahs above them on the second story are in fine taste. The eruption of flag-poles is, of course, a transient disease, peculiar to the season. They have no abiding-place on a permanent structure like this destined to outlive the exposition.

Entering from the side by a neat flight of steps in dark marble, we find ourselves in a gayly-tiled vestibule thirty feet square, between forcing-houses each a hundred by thirty feet. Advancing, we enter the great conservatory, two hundred and thirty by eighty feet, and fifty-five high, much the largest in this country, and but a trifle inferior in height to the palm-houses of Chatsworth and Kew. A gallery twenty feet from the floor will carry us up among the dates and cocoanuts that are to be. The decorations of this hall are in keeping with the external design. The woodwork looks out of place amid so much of harder material; but there is not much of it.

Outside promenades, four in number and each a hundred feet long, lead along the roofs of the forcing-houses, and contribute to the portfolio of lovely views that enriches the Park. Other prospects are offered by the upper floors of the east

and west fronts; the aërial terrace embracing in all seventeen thousand square feet. The extreme dimensions of the building are three hundred and eighty by one hundred and ninety-three feet. Restaurants, reception-rooms and offices occupy the two ends. The contractor who performed his work so satisfactorily is Mr. John Rice.

A few years hence this winter-garden will, with one exception to which we next proceed, be the main attraction at the Park. It will by that time be effectively supplemented by thirty-five surrounding acres of out-door horticulture, to which the soil of decomposed gneiss is well suited.

Passing from the bloom of Nature, we complete our circuit with that which springs from the pencil, the chisel and the burin. Here we alight upon another instance of inadequate calculation. That the art-section of the exposition would fill a building three hundred and sixty-five by two hundred and ten feet, affording eighty-nine thousand square feet of wall-surface for pictures, must, when first proposed, have struck the most imaginative of the projectors as a dream. The actual result is that it proved indispensably necessary to provide an additional building of very nearly equal dimensions, or three hundred and forty-nine by a hundred and eighty-six feet, to receive the contributions offered; and this after the promulgation of a strict requirement that "all works of art must be of a high order of merit." Half the space in the extension had been claimed by Great Britain, Germany, France, Belgium, Austria and Italy before ground was broken for its foundation; and recent demands at home have rendered necessary a further projection of the wings, with the effect of giving to the building the form of a Greek cross.

This building is on the rear, or north side, of Memorial Hall, and is the first portion of the fine-art department that meets the eye of one coming from Horticultural Hall. It is of comparatively temporary character, being built of brick instead of the solid granite that composes the pile in front of it. Its architectural pretensions are of course inferior. It is the youngest of all the exposition buildings, the centennial spring witnessing its commencement and completion. The drying of such green walls in such manner as to render them safe for valuable pictures was perfectly secured by the use of "asbestos" brick, which is said to be fire- as well as water-proof. This annex is classed among the permanent structures, but will hereafter be necessarily remodelled to bring it into harmony with its site and with the edifice to which it is an appendage.

Memorial Hall, as its name implies, contemplates indefinite durability. What Virginia and Massachusetts granite, in alliance with Pennsylvania iron, on a basis of a million and a half of dollars, can effect in that direction, seems to have been done. The façade, designed by Mr. Schwarzmann, is in ultra-Renaissance; the arch and balustrade and open arcade quite overpowering pillar and pediment. The square central tower, or what under a circular dome would be the drum, is quite in harmony with the main front so far as proportion and outline are concerned; but there is too much blank surface on the sides to match the more "noisy" details below it. This apart, the unity of the building is very striking. That its object, of supplying the best light for pictures and statuary, is not lost sight of, is evidenced by the fact that three-fourths of the interior space is lighted from above, and the residue has an ample supply from lofty windows. The figures of America, Art, Science, etc. which stud the dome and parapet were built on the spot, and will do very well for the present. The eagles are too large in proportion, and could easily fly away with the allegorical damsels at their side.

The eight arched windows of the corner towers, twelve and a half by thirty-four feet, are utilized for art-display. Munich fills two with stained glass: England also claims a place in them. The iron doors of the front are inlaid with bronze panels bearing the insignia of the States; the artist prudently limiting himself to that modest range of subjects in recognition of the impossibility

of eclipsing Ghiberti at six months' notice. Thirty years is not too much time to devote to completing the ornamentation of this building. Among the millions of people passing through it in the course of its first year, there will undoubtedly be some capable of making sound suggestions for its finish. The wisdom that comes from a multitude of counsels will remain to be sifted. Then will remain the creation of the artists who are to carry the counsels into execution. We shall be fortunate if the next three decades bring us men thoroughly equal to the task.

It would be an unpardonable neglect

MEMORIAL HALL, WITH EXTENSION.

of the maxim which enjoins gratitude to the bridge that carries us safely over were we to complete our tour of the exposition structures without a glance at the graceful erections, diverse in magnitude and design, which overleap the depressions so attractive to the student of the picturesque and so trying to the pedestrian. The æsthetic capabilities of bridge architecture are very great, and a fine field is here offered for their display. The flat expanses of Hyde Park, the Champs de Mars and the Prater could afford no such exhibition. The ground and the buildings became, perforce, two sharply distinct things; and the blending into unity of landscape and architecture could be but imperfectly attained. Here the case is very different. With the aid of an art that embraces in its province alike the fairy trellis and the monumental arch and pilaster, the lines of Memorial Hall and other permanent edifices may be led over the three hundred acres appropriated to the exposition. From the foundation of a bridge-pier to the crowning statue of America, the artist finds an uninterrupted range.

The work of his foster-brother, the artisan, has certainly been well done. The structures we have been traversing are, in their way, works of art—very worthy, if not the choicest conceivable, blossoms of our century-plant. For fitness, the quality that underlies beauty throughout Nature from the plume to the tendril and the petal, they have not been surpassed in their kind. Every flange, bolt, sheet and abutment has been well thought out. Whatever the purpose, to bind or to brace, to lift or to support, everything tells.

PART V.

MINOR STRUCTURES OF THE EXHIBITION.

FOUNTAIN OF THE CATHOLIC TOTAL ABSTINENCE UNION.

COMPRESS it as you may, this globe of ours remains quite a bulky affair. The world in little is not reducible to a microscopic point. The nations collected to show their riches, crude and wrought, bring with them also their wants. For the display, for its comfort and good order, not only space, but a carefully-planned organization and a multiplicity of appliances are needed. Separate or assembled, men demand a home, a government, workshops, show-rooms and restaurants. For even so paternal and, within its especial domain, autocratic a sway as that of the Centennial Commission to provide all these directly would have been impossible. A great deal was, as in the outer world, necessarily left to private effort, combined or individual.

Having in our last paper sketched the provision made by the management for sheltering and properly presenting to the eye the objects on exhibition, we shall now turn from the strictly public build-

ings to the more numerous ones which surround them, and descend, so to speak, from the Capitol to the capital.

Our circuit brought us back to the neighborhood of the principal entrance. Standing here, facing the interval between the Main Building and Machinery Hall, our eyes and steps are conducted from great to greater by a group of buildings which must bear their true name of offices, belittling as a title suggestive of clerks and counting-rooms is to dimensions and capacity exceeding those of most churches. Right and left a brace of these modest but sightly and habitable-looking foot-hills to the Alps of glass accommodate the executive and staff departments of the exposition. They bring together, besides the central administration, the post, police, custom-house, telegraph, etc. A front, including the connecting verandah, of five hundred feet indicates the scale on which this transitory government is organized.

Farther back, directly opposite the entrance, but beyond the north line of the great halls, stands the Judges' Pavilion. In this capacious "box," a hundred and fifty-two by a hundred and fifteen feet, the grand and petit juries of the tribunal of industry and taste have abundant elbow-room for deliberation and dis-

JUDGES' PAVILION.

cussion. The same enlightened policy which aimed at securing the utmost independence and the highest qualifications of knowledge and intelligence in the two hundred men who determine the awards, recognized also the advantage of providing for their convenience. Their sessions here could be neither cramped nor disturbed. So far as foresight could go, there was nothing to prevent their deciding quietly, comfortably and soundly, after mute argument from the vast array of objects submitted to their verdict, on the merits of each. The main hall of this building, or high court as it may be termed, is sixty by eighty feet, and forty-three feet high. In the rear of it is a smaller hall. A number of other chambers and committee-rooms are appropriated to the different branches as classified. Accommodation is afforded, besides, to purposes of a less arid nature —fêtes, receptions, conventions, international congresses and the like. This cosmopolitan forum might fitly have been modeled after

> the tower that builders vain,
> Presumptuous, piled on Shinar's plain.

Bricks from Birs Nimroud would have been a good material for the walks. Perhaps, order being the great end, anything savoring of confusion was thought out of place.

Fire is an invader of peace and prop-

WOMEN'S PAVILION.

erty, defence against whose destructive forays is one of the first and most constant cares of American cities, old and new, great and small. Before the foundations of the Main Building were laid the means of meeting the foe on the threshold were planned. The Main Building was fitted with seventy-five fire-plugs, with pressure sufficient to throw water over its highest point. Adjacent on the outside stood thirty-three more. The protection of Machinery Hall, containing the headquarters of the fire-service, was entrusted to seventy-six others. A large outfit of steam fire-engines, hose, trucks, ladders, extinguishers and other appliances of the kind made up a force powerful enough, one would think, to put out that shining light in the records of conflagration—Constantinople. Steam is kept up night and day in the engines, which, with their appurtenances, were manned by about two hundred picked men. The houses for their shelter, erected at a cost of eight thousand dollars, complete, if we except some architectural afterthoughts in the shape of annexes, the list of the buildings erected by the commission.

Place aux dames! First among the independent structures we must note the Women's Pavilion. After having well earned, by raising a large contribution to the Centennial stock, the privilege of expending thirty-five thousand dollars of their own on a separate receptacle of products of the female head and hand, the ladies selected for that a sufficiently modest site and design. To the trait of modesty we cannot quite say the building has failed to add that of grace. In this respect, however, it does not strike us as coming up to the standard attained by some of its neighbors. The low-arched roofs give it somewhat the appearance of a union railway-dépôt; and one is apt to look for the emergence from the main entrances rather of locomotives than of ladies. The interior, however is more light and airy in effect than the exterior. But "pretty is that pretty does" was a favorite maxim of the Revolutionary dames; and the remarkable energy shown by their fair descendants, under the presidency of Mrs. E. D. Gillespie, in carrying through this undertaking will impart to it new force. The rule is quite in harmony with it that mere frippery should be avoided within and without, and the purely decorative architect excluded with Miss McFlimsey. The ground-plan is very simple, blending the cross and the square. Nave and tran-

sept are identical in dimensions, each being sixty-four by one hundred and ninety-two feet. The four angles formed by their intersection are nearly filled out by as many sheds forty-eight feet square. A cupola springs from the centre to a height of ninety feet. An area of thirty thousand square feet strikes us as a modest allowance for the adequate display of female industry. For the filling of the vast cubic space between floor and roof the managers were fain to invoke the aid of an orchestra of the sterner sex to keep it in a state of chronic saturation with music.

UNITED STATES GOVERNMENT BUILDING.

Flowers naturally seek the haunts of woman and spring up in her footsteps. The surroundings of her Pavilion would be incomplete without them. Hence a system of parterres connecting with the double chain extending with Fountain avenue to Horticultural Hall, and which, not themselves architectural, provide a gay foil for architecture, and will outlast in terrace and sunken garden most of the ephemeral buildings born with them. This gay embroidery, more beautiful and produced with less wear and tear of health and strength than the lace, the shelter and exhibition of which was one purpose of the Pavilion, may be classed with woman's handiwork; for it is her taste and demand that gives the florist employment.

Nor does the sex extend traces of its sway in this direction alone. A garden of quite another kind, meant for blossoms other than those of spring, and still more dependent upon woman's nurture, finds a place in the exposition grounds near the Pavilion. Of the divers species of *Garten—Blumen-*, *Thier-*, *Bier-*, etc.—rife in Vaterland, the *Kinder-* is the latest selected for acclimation in America. If the mothers of our land take kindly to it, it will probably become something of an institution among us. But that is an *If* of portentous size. The mothers aforesaid will have first to fully comprehend the new system. It is not safe to say with any confidence at first sight that we rightly understand any conception of a German philosopher; but, so far as we can make it out, the Kindergarten appears to be based on the idea of formulating the child's physical as thoroughly as his intellectual training, and at the same time closely consulting his idiosyncrasy in the application of both. His natural disposition and endowments are to be sedulously watched, and guided or wholly repressed as the case may demand. The budding artist is supplied with pencil, the nascent musician with trumpet or tuning-fork, the florist with tiny hoe and trowel, and so on. The boy is never loosed, physically or metaphysically, quite out of leading-strings. They are made, however, so elastic as scarce to be felt, and yet so strong as never to break. Moral suasion, perseveringly applied, predominates over Solomon's system. It is a very nice theory,

and we may all study here, at the point of the lecture-rod wielded by fair fingers, its merits as a specific for giving tone to the constitution of Young America.

At the side of the Kindergarten springs a more indigenous growth—the Women's School-house. In this reminder of early days we may freshen our jaded memories, and wonder if, escaped from the dame's school, we have been really manumitted from the instructing hand of women, or ever shall be in the world, or ought to be.

Is the "New England Log-house," devoted to the contrasting of the cuisine of this and the Revolutionary period, strictly to be assigned to the women's ward of the great extempore city? Is its proximity to the buildings just noticed purely accidental, or meant to imply that cookery is as much a female art and mystery as it was a century ago? However this may be, the erection of this temple to the viands of other days was a capital idea, and a blessed one should it aid in the banishment of certain popular delicacies which afflict the digestive apparatus of to-day. This kitchen of the forest epoch is naturally of logs, and logs in their natural condition, with the bark on. The planking of that period is represented by clapboards or slabs. Garnished with ropes of onions, dried apples, linsey-woolsey garments and similar drapery, the aspect of the walls will remind us of Lowell's lines:

> Crook-necks above the chimly hung,
> While in among 'em rusted
> The old Queen's-arm that Gran'ther Young
> Brought back from Concord busted.

The log-house is not by any means an abandoned feature of antiquity. It is still a thriving American "institution" North, West and South, only not so conspicuous in the forefront of our civilization as it once was. It turns out yet fair women and brave men, and more than that—if it be not treason to use terms so unrepublican—the highest product of this world, gentlemen and gentlewomen.

Uncle Sam confronts the ladies from over the way, a ferocious battery of fifty-seven-ton Rodman guns and other monsters of the same family frowning defiance to their smiles and wiles. His traditional dread of masked batteries may have something to do with this demonstration. He need not fear, however. His fair neighbors and nieces have their hands full with their own concerns, and leave him undisturbed in his stately bachelor's hall to "illustrate the functions and administrative faculties of the government in time of peace and its resources as a war-power." To do this properly, he has found two acres of ground none too much. The building, business-like and capable-looking, was erected in a style and with

OHIO BUILDING.

a degree of economy creditable to the officers of the board, selected from the Departments of War, Agriculture, the Treasury, Navy, Interior and Post-Office, and from the Smithsonian Institution. Appended to it are smaller structures for the illustration of hospital and laboratory work—a kill-and-cure association that is but one of the odd contradictions of war.

The sentiments prevalent in this era of perfect peace, harmony and balance of rights forbids the suspicion of any significance in the fact that the lordly palace of the Federal government at once

NEW JERSEY BUILDING.

overshadows and turns its back upon the humbler tenements of the States. A line of these, drawn up in close order, shoulder to shoulder, is ranged, hard by, against the tall fence that encloses the grounds. The Keystone State, in the original plan, heads the line by the left flank. Then come, in due order, Ohio, Indiana, Illinois, Michigan, Wisconsin, New Hampshire, Connecticut, Massachusetts and Delaware. New Jersey and Kansas stand proudly apart, officer-like, on the opposite side of the avenue; the regimental canteen, in the shape of the Southern Restaurant, jostling them rather too closely. Somewhat in keeping with the over-prominence of the latter adjunct is the militia-like aspect of the array, wonderfully irregular as are its members in stature and style. Pennsylvania's pavilion, costing $40,000, or half as much as the United States building, modestly declined the grenadier's place and took another position; but little Delaware, not content with the obscure post of file-closer, swells at the opposite end of the line into dimensions of ninety by seventy-five feet, with a cupola that, if placed at Dover, would be visible from half her territory.

These buildings are all of wood, with the exception of that of Ohio, which exhibits some of the fine varieties of stone furnished by the quarries of that State, together with some crumbling red sandstone which ought, in our opinion, to have been left at home. All have two floors, save the Massachusetts cottage, a quaint affair modeled after the homes of the past. Virginia ought to have placed by its side one of her own old country-houses, long and low, with attic windows, the roof spreading with unbroken line over a portico the full length of the front, and a broad-bottomed chimney on the outside of each gable. The State of New York plays orderly sergeant, and stands in front of Delaware. She is very fortunate in the site assigned her, at the junction of State Avenue with several broad promenades, and her building is not unworthy so prominent a position.

From the Empire State we step into the domain of Old England. Three of her rural homesteads rise before us, red-tiled, many-gabled, lattice-windowed, and telling of a kindly winter with external chimneys that care not for the hoarding of heat. It is a bit of the island peopled by some of the islanders. They are colonized here, from commissioner in charge down to private, in a cheek-by-jowl fashion that shows their ability to unbend and republicanize on occasion. Great Britain's head-quarters

are made particularly attractive, not more by the picturesqueness of the buildings than by the extent and completeness of her exhibit. In her preparations for neither the French nor the Austrian exposition did she manifest a stronger determination to be thoroughly well represented. Col. H. B. Sanford, of the Royal Artillery, heads her commission.

Japan is a common and close neighbor to the two competitors for her commercial good-will, England and New York. Modern Anglo-Saxondom and old Cathay touch eaves with each other. Hemlock and British oak rub against bamboo, and dwellings which at first sight may impress one as chiefly chimney stand in sharp contrast with one wholly devoid of that feature. The difference is that of nails and bolts against dovetails and wooden pins; of light and pervious walls with heavy sun-repelling roof against close and dense sides and roofs whose chief warfare is with the clouds; of saw and plane that work in Mongol and Caucasian hands in directions precisely reversed. To the carpenters of both England and Japan our winter climate, albeit far milder than usual, was alike astonishing. With equal readiness, though not with equal violence to the outer man, the craftsmen of the two nations accommodated themselves to the new atmospheric conditions. The moulting process, in point of dress, through which the Japanese passed was not untypical of the change the institutions of their country have been undergoing in obedience to similarly stern requirements. It did not begin at quite so rudimental a stage of costume as that of the porters and wrestlers presented to us on fans, admirably adapted as that style might be to our summer temperature. In preparing for that oscillation of the thermometer the English are called on for another change, whereas the Orientals may meet it by simply reverting to first principles.

The delicacy of the Asiatic touch is exemplified in the wood-carving upon the doorways and pediments of the Japanese dwelling. Arabesques and reproductions of subjects from Nature are executed with a clearness and precision such as we are accustomed to admire on the lacquered-ware cabinets and bronzes of Japan. With us, wood has almost completely disappeared as a glyptic material. The introduction of mindless automatic machinery has starved out the chisel. Mouldings are run out for us by the mile, like iron from the rolling-mill or tunes from a musical-box, as cheap and as soulless. Forms innately beautiful thus become almost hateful, because hackneyed. If all the women we see were at once faultlessly beautiful and absolute duplicates of each other in the minutest details of feature, complexion, dress and figure, we should be in danger of conceiving an aversion to the sex.

NEW YORK BUILDING.

So there is a certain pleasure in tracing in a carven object, even though it be hideous, the patient, faithful, watchful work of the human hand guided at every instant by the human eye. And this

Japanese tracery is by no means hideous. The plants and animals are well studied from reality, and truer than the average of popular designs in Europe a century ago, if not now. It is simple justice to add that for workmanlike thoroughness this structure does not suffer in comparison with those around it.

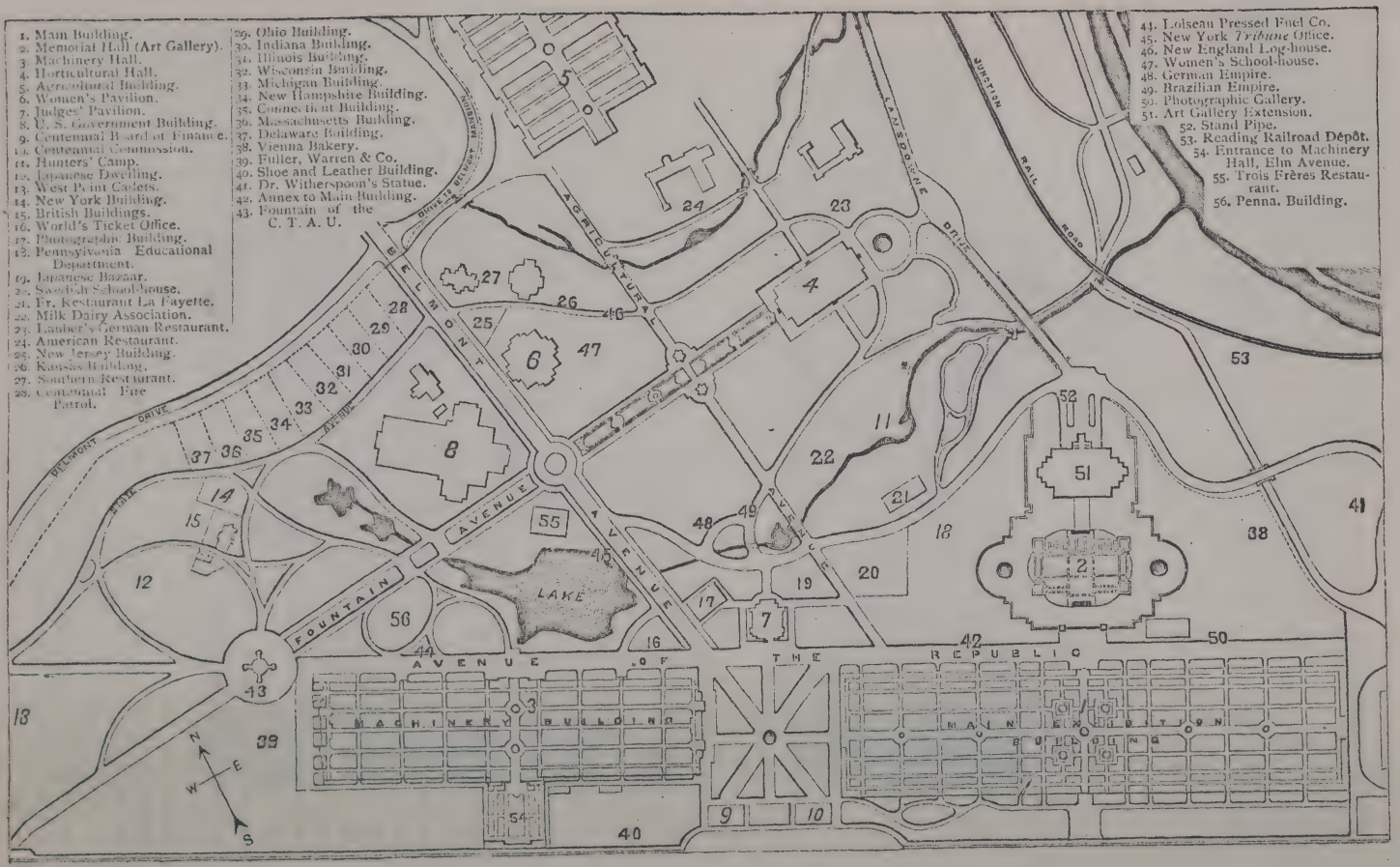
Besides this dwelling for its employés, the Japanese government has in a more central situation, close to the Judges' Pavilion, another building. The style of

PENNSYLVANIA BUILDING.

this is equally characteristic. Together, the two structures will do what houses may toward making us acquainted with the public and private ménage of Japan.

In the neat little Swedish School-house, of unpainted wood, that stands next to the main Japanese building, we have another meeting of antipodes. Northern Europe is proud to place close under the eye of Eastern Asia a specimen of what she is doing for education. Sweden has indeed distinguished herself by the interest she has shown in the exposition. At the head of her commission was placed Mr. Dannfeldt, who supervised her display at Vienna. His activity and judgment have obviously not suffered from the lapse of three years. This schoolhouse is attractive for neatness and peculiarity of construction. It was erected by Swedish carpenters. The descendants of the hardy sea-rovers, convinced that their inherited vigor and thrift could not be adequately illustrated by an exclusively in-doors exhibition, sent their portable contributions in a fine steamer of Swedish build, the largest ever sent to sea from the Venice of the North, and not unworthy her namesake of the Adriatic. To compete in two of its specialties with the cradle of the common school and the steamship is a step that tells of the bold Scandinavian spirit.

The contemporaries and ancient foes of the Northmen, who overthrew the Goths on land and checkmated the Vikings in the southern seas, have a memorial in the beautiful Alhambra-like edifice of the Spanish government. Spain has no architecture so distinctive as that of the Moors, and the selection of their style for the present purpose was in good taste. It lends itself well to this class of building, designed especially for summer use; and many other examples of it will be found upon the grounds. The Mohammedan arch is suited better to materials, like wood and iron, which sustain themselves in part by cohesion, than to stone, which depends upon gravitation alone. Although it stands in stone in a long cordon of colonnades from the Ganges to the Guadalquivir, the eye never quite reconciles itself to the suggestion of untruth and feebleness in the recurved base of the arch. This defect,



PLAN OF EXHIBITION GROUNDS.

however, is obtrusive only when the weight supported is great; and the Moorish builders have generally avoided subjecting it to that test.

Spain also has taken the liberty of widening the range of her contributions. Soldiers, for instance, find no place in the official classification of subjects for exhibition. She naturally thought it worth while to show that the famous *in-*

JAPANESE BUILDING.

fanteria of Alva, Gonsalvo, and Cuesta "still lived." So she sent us specimens of the first, if not just now the foremost, of all infantry. This microscopic invasion of our soil by an armed force will be useful in reminding us of the untiring tenacity which took no note of time or of defeat, and which, indifferent whether the struggle were of six, fifty, or seven hundred years, wore down in succession the Saracens, the Flemings and the French.

Samples in this particular walk of competition come likewise from the battle-ground of Europe, Belgium sending a detachment of her troops for police duty. We may add that the Centennial has brought back the red-coats, a detachment of Royal Engineers, backed by part of Inspector Bucket's men, doing duty in the British division.

After these first drops of the military shower one looked instinctively for the gleam of the spiked helmet at the portals of the German building, seated not far from that of Spain, and side by side with that of Brazil. It did not appear, however. Possibly, Prince Bismarck scorned to send his veterans anywhere by permission. Neither did he indulge us, like Brazil, with the sight of an emperor, or even with cæsarism in the dilute form of a crown prince. Such exotics do not transplant well, even for temporary potting, in this republican soil. It is impossible, at the same time, not to reflect what a capital card for the treasury of the exposition would have been the catching of some of them in full bloom, as at the openings of 1867 and 1873. A week of Wilhelm would have caused "the soft German accent," with its tender "hochs!" to drown all other sounds between Sandy Hook and the Golden Gate.

Let us step over the Rhine, or rather, alas! over the Moselle, and look up at the tricolor. It floats above a group of structures—one for the general use of the French commission, another for the special display of bronzes, and a third for another art-manufacture for which France is becoming eminent—stained glass. This overflowing from her great and closely-occupied area in Memorial Hall, hard by, indicates the wealth of France in art. She is largely represented, moreover, in another outlying province of the same domain—photography.

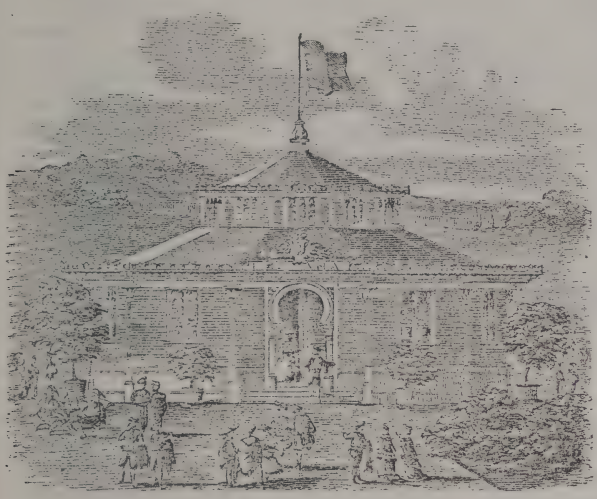
Photographic Hall, an offshoot from Memorial Hall, and lying between it and the Main Building, is quite a solid structure, two hundred and fifty-eight feet by one hundred and seven, with nineteen thousand feet of wall-space. Conceding this liberally to foreign exhibitors, an association of American photographers erected a hall of their own in another direction, upon Belmont Avenue beyond the Judges' Pavilion; by this means exhibiting the art in operation under an American sun, and enabling our photographers to compare notes and processes with their European fellows, who treat under different atmospheric conditions a wider range of subjects. This is the largest studio the sun, in his capacity of artist on paper, has ever set up, as the hall provided for him by the exposition is the largest gallery he has ever filled. Combined, they may reasonably be expected to bear some fruit in the way of drawing from him the secret he still withholds—the addition of color to light and shade in the fixed images of the camera. This further step seems, when we view within the camera the image in perfect panoply of all its hues, so very slight in comparison with the original discovery of Daguerre, that we can hardly refer it to a distant future.

Questions of finance naturally associate themselves with sitting for one's portrait, even to the sun. A national bank becomes a necessity to their readier solution, be they suggested by this or any other item of expense. Such an institution has consequently a place in the outfit of the Centennial. Here it stands within its own walls, under its own roof and behind its own counter. The traditional cashier is at home in his parlor, the traditional teller observes mankind from his rampart of wire and glass, and the traditional clerk busy in the rear studies over his shoulder the strange accent and the strange face. Over and above the conveniences for exchange afforded by the bank, it will introduce to foreigners the charms of one of our newest inventions—the greenback. This humble but heterodox device, not pleasant in the eyes of the old school of conservative financiers, is yet unique and valuable as having accomplished the task of absolutely equalizing the popular currency of so large a country as the Union. That gap of twelve or thirteen per cent. between greenbacks and gold is no doubt an *hiatus valde deflendus*—a gulf which has swallowed up many an ardent and confident Curtius, and will swallow more before it disappears; but the difference is uniform everywhere, and discounts itself. Whatever the faults of our paper-money, it claims a prominent place among the illustrations of the close of the century, for it is the only currency save copper and Mr. Memminger's designs in blue that a majority of Americ-

SWEDISH SCHOOL-HOUSE.

can youth have ever seen. Should these young inquirers wish to unearth the money of their fathers, they can find the eagles among other medals of antiquity in the Mint department of the United States Government Building.

His fiscal affairs brought into comfortable shape, the tourist from abroad may be desirous of seeing more of the United States than is included in the view from the great Observatory. The landscape visible from that point, after the process



SPANISH BUILDING.

of being wound to the top by steam, is not flecked with buffaloes or even the smoke of the infrequent wigwam, as the incautious reader of some Transatlantic books of travel might expect. For the due exploration of at least a portion of the broad territory that lies inside of the buffalo range he needs a railway-ticket and information. These are at his command in the "World's Ticket and Inquiry Office," the abundantly comprehensive name of a building near the north-east corner of Machinery Hall. In a central area sixty feet in diameter tickets to every known point are offered to him by polyglot clerks. Here, too, a wholesome interchange of ideas in regard to the merits of the various traveling regulations of different countries may be expected. Baggage-checks or none, compartment or saloon cars, ventilation or swelter in summer, freezing or hot-water-pipes in winter, and other like differences of practice come under consideration with travelers in general council assembled. Give and take must prevail between our voyagers and railway officials and those of the Old World. Both sides may teach and learn. Should the carriage of goods instead of persons be in question, the American side of the materials for its discussion will be found in the building of the Empire Transportation Company, where the economies of system and "plant," which have for a series of years been steadily reducing the expenses of railway-traffic until the cost of carrying a ton one mile now falls within one cent, are minutely detailed. A further reduction of this charge may result from the exposition if exhibitors from Europe succeed in explaining to our engineers and machinists how they manage to lighten their cars, and thereby avoid carrying the excess of dead weight which contributes so much to the annihilation of our tracks and dividends.

The telegraph completes the mastery over space in the conveyance of thought that the railway attains in that of persons and property. Its facilities here are commensurable with its duty of placing thousands of all countries in instantaneous communication with their homes. Those from over-sea discover that, instead of dragging "at each remove a lengthening chain," they are, on the exposition grounds, in point of intercourse nearer home than they were when half a day out from the port of embarkation, and ten days nearer than when they approached our shores after a sail of three thousand miles. To get out of call from the wire it is necessary to go to sea—and stay there. Another hundred years, and even the seafarer will fail of seclusion. Floating telegraph-offices will buoy the cable. Latitude 40° will "call" the

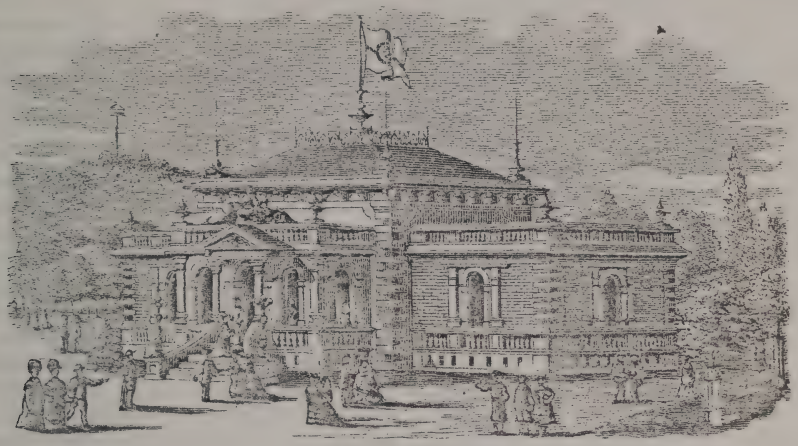
Equator, and warn Grand Banks that "Sargasso is passing by." Not only will the march of Morse be *under* the mountain-wave, but his home will be on the deep.

The submarine and terrestrial progress of the telegraph was in '67 and '73 already an old story. At the Centennial it presented itself in a new rôle — that of interpreter of the weather and general storm-detector. This application of its powers is due to American science. Indeed, the requisites for experiments were not elsewhere at command. A vast expanse of unbroken territory comprising many climates and belts of latitude and longitude, and penetrated throughout by the wire under one and the same control, did not offer itself to European investigators. These singular advantages have been well employed by the United States Signal Service within the past five years. Its efforts were materially aided by the antecedent researches of such men as Espy and Maury, the latter of whom led European savants into the recognition of correct theories of both air- and ocean-currents. Daily observations at a hundred stations scattered over the continent, exactly synchronized by telegraph, yielded deductions that steadily grew more and more consistent and reliable, until at length those particularly fickle instruments, the weather-vane, the thermometer, the barometer and the magnetic fluid, have formed, in combination, almost an "arm of precision." The predictions put forth in the "small hours" each morning by the central office in Washington assume only the modest title of "Probabilities." Some additional expenditure, with a doubling of the number of stations, would within a few years make that heading more of a misnomer. Meanwhile, the saving of life and property on sea and land already effected is a solid certainty and no mere "probability." At the station on the exposition grounds the weather of each day, storm or shine, in most of the cities of the Old and New Worlds stood bulletined. "Storm in Vlaenderlandt" could be as surely announced to the Dutch stroller on Belmont avenue as though he were within hearing of his cathedral bell. Should such a "cautionary signal" from beyond the ocean reach him, he might ascertain in what, if any, danger of submergence his home stood, by stepping into one of the branch telegraph-

BRITISH BUILDINGS.

offices dispersed over the grounds. Or he might satisfy all possible craving for news from that or any other quarter in the Press Building. This metropolis of the fourth estate occupies a romantic site on the south side of the avenue and the north bank of the lake. Such a focus of the news and newspapers of all nations

was not paralleled at either of the preceding expositions. American journalism was additionally represented in the different State buildings, where files of all the publications of each commonwealth could be found, embracing in most cases a greater number of journals than the entire continent boasted in 1776, and



GERMAN BUILDING.

in each of the States of Ohio, New York and Pennsylvania more than the extra-metropolitan press of either France, Austria, Prussia or Russia can now boast.

The commercial idea is so prominent in this, as in all expositions, that it is difficult to draw the line between public and private interest among its different features, and particularly among what may be called its outgrowths, overflowings or addenda. Here is half a square mile dotted with a picturesque assemblage of shops and factories, among which everything may be found, from a soda-fountain or a cigar-stand up to a monster brewery, all devoted at once to the exemplification and the rendering immediately profitable of some particular industry. In one ravine an ornate dairy, trim and Arcadian in its appurtenances and ministers as that of Marie Antoinette and her attendant Phillises at the Petit Trianon, offers a beverage presumably about as genuine as that of '76, and much above the standard of to-day. A Virginia tobacco-factory checkmates that innocent tipple with "negrohead" and "navy twist." A bakery strikes the happy medium between the liquid sustenance and the narcotic luxury by teaching Cisatlantic victims of baking-powders and salæratus how to make Vienna bread. Recurring to fluids, we find unconquered soda popping up, or down, from innumerable fonts —how many, may be inferred from the fact that a royalty of two dollars on each spigot is estimated to place thirty-two thousand dollars in the strong box of the exposition. Nor does this measure the whole tribute expected to be offered at these dainty shrines of marble and silver. The two firms that bought the monopoly of them paid in addition the round sum of twenty thousand dollars. It speaks well for the condition of the temperance cause that beer is the nearest rival of aërated water. An *octroi* of three dollars per barrel is estimated to yield fifty thousand dollars, or two thousand dollars less than soda-water. Seventy-five thousand dollars is the aggregate fee of the restaurants. Of these last-named establishments, the French have two. The historic sign of the Trois Frères Provençaux is assumed by a vast edifice in one of the most conspicuous parts of the enclosure, sandwiched between the Press and the Government. The "Sudreau" affects the fine arts and cultivates with like intimacy the society of Memorial Hall.

The German refectory, Lauber's, a solid, beery sort of building, shows a fine bucolic sense by choosing a hermitage in the grove between Agricultural and Horticultural Halls. A number of others, of greater or less pretensions to style, onabled the visitor to exclaim, with more or less truth, toward the dusty evening, "Fate cannot harm me: I have dined to-day."

"Dusty," did we say? The ceaseless sob of engines that rob the Schuylkill daily of six millions of gallons to sprinkle over asphaltum, gravel and greensward demands recantation of the word. Everything has been foreseen and considered, even the dust of the earth. George's Hill Reservoir can, on occasion, give the pumps several days' holiday, and keep all fresh and dewy as the dawn.

Some industries meet us in the Centennial list that are not to be detected in the United States census or any other return we are acquainted with. What train of ideas, for example, is suggested to the average reader by the Roll-Chair Company? The rolling-stock of this association turns out, on inquiry, to be an in-door variety of the conveyance wherein Mrs. Skewton was wont to take the air under the escort of Major Bagstock. It was meant for the relief of those who wish to see everything in the Main Building without trudging eleven miles. Given an effective and economical motive-power, the roll-chair system would seem to meet this want. The reader of *Dombey and Son* will recollect the pictorial effect, in print and etching, of the popping up of the head of the propellent force when Mrs. S. called a halt, and its sudden disappearance on her directing a resumption of movement. The bobbing up and down of four hundred and fifty heads, like so many seals, imparted a unique aspect to the vista from one of the interior galleries of the great hall. The stipulated tax of forty dollars on each of these vehicles necessitated a tolerably active undulation of polls if the company hoped to make both ends meet—granting that a rotatory movement can have an end.

Another startling item is the pop-corn privilege. A business-man of Dayton, Ohio, found himself justified in venturing the heavy sum of seven thousand dollars on this very light article. Parched corn was well known in Ohio in 1776. The Miamis and Shawnees had, however, a monopoly of it. It composed their commissariat for a campaign against the whites. Such is the progress of the century.

This explosive cereal does not satiate the proverbially sweet tooth of our people. Their craving for confectionery was laid under further contribution by the financial managers of the exposition to the tune, for instance, of five thousand dollars for the privilege of manufacturing chocolate and candy. Dyspepsia insists on asserting its position among the other acquisitions of the century. The treasures of the American bonbonnière are said to be richer and more varied than in any other country. Paris gets up her delicacies of this kind in more tasteful and tempting style, but our consumers care little for such superficial vanities. They look for solid qualities in everything—even in their lollipops.

Another description of fuel, employed for the external and not the internal feeding of the animal machine, and quite as evanescent as candy, claims a factory to itself. This is a French invention called the Loiseau Compressed Fuel. Bringing it to Philadelphia, the mart of the anthracite region, would seem to be carrying coals to Newcastle. The relation between demand and supply in fuel is happily, for the present, on too sound a basis to leave much room for artificial substitutes. Our anthracite deposits are circumscribed, but bid fair to last until the virtually untouched seams of bituminous and semi-bituminous coal shall be made amply accessible to every point of consumption. We are not yet in the slightest perceptible danger of the coal-famine that threatens Great Britain.

In regard to the accommodations provided outside of the exhibition buildings by individual enterprise for the display of various products and processes of manufacture, it will here suffice to say

that they notably exceeded the corresponding array at any of the European expositions. Illustrations of the social and industrial life of different races and nations were, on the other hand, inferior to what was seen at Vienna and Paris. Mankind and their manners are more homogeneous within an available circle around Philadelphia than around either of those capitals. The rude populations of the lower Danube, the Don, the Caucasus, the Steppes, Albania, Syria, Barbary, etc. cannot be so fully represented here. That they should be, were it practicable, would be more to their advantage than to ours perhaps, the probability being slight that we should deem it desirable to adopt many of their methods. Nor could the eating and drinking of the nations be so variously illustrated as in the cordon of restaurants that so largely contributed to the spectacular effect at Paris. The French genius for the dramatic was quite at home in arranging that part of the display; and they did not allow the full effect to suffer for want of some artificial eking out. The kibaubs, pilau and sherbet that were served up in fine Oriental style were not in all cases prepared by Turks, Persians and Tunisians. The materials were abundant in Paris for these and any other outlandish dainties that might be called for. So were costumers. There was no reason, therefore, why imitations should not be got up capable of serving every purpose, and of giving more amusement than the genuine dishes and divans of Islam would have done. The negro waiters in the American saloon doubtless outnumbered all the other representatives of the dark or semi-civilized races that appeared in a similar character. They proved a success, their genial bearing and ever-ready smile pleasing the mass of the guests more than did the *triste* and impassive Moslem. The theatrical can just as well be done here, and *quant. suff.* of Cossacks and Turks be manufactured to order. Then we have John and Sambo in unadulterated profusion; the former ready at the shortest notice and for very small compensation to indoctrinate all comers in the art of plying the chopsticks, and the latter notoriously in his element in the kitchen and the dining-room, and able to aid the chasse-café with a song—lord alike of the carving-knife, the cocktail and the castanets.

Water, the simplest, most healthful and most indispensable of all refreshments, is provided without stint and without price. Foreigners are struck with the immense consumption of water as a beverage in this country. They do not realize the aridity of our summer climate, which makes it sometimes as much of a luxury here as it is in the desert. A rill of living water, let it issue from a mossy rift in the hillside or the mouth of a bronze lion, comes to us often like the shadow of a great rock in a weary land. We lead fevered lives, too, and this is the natural relief. Fountains are among the first decorations that show themselves in public or private grounds. They give an excuse and a foothold for sculpture, and thus open the way for high art. In the Centennial grounds and in all the buildings upon them, of whatever character, the fountain, in more or less pretentious style, plays its part. Led from the bosom of a thousand hills, drawn from under the foot of the fawn and the breast of the summer-duck, it sprang up into the midst of this hurly-burly of human toil and pleasure, the one unartificial thing there, pure and pellucid as when hidden in its mother rock.

It is not remarkable, then, that the most ambitious effort of monumental art upon the exposition grounds should have taken the shape of a fountain. The erection is due to the energy and public spirit of the Catholic Total Abstinence Union. The site chosen is at the extreme western end of Machinery Hall. It looks along Fountain Avenue to the Horticultural Building. Mated thus with that fine building, it becomes a permanent feature of the Park. The central figure is Moses—not the horned athlete we are apt to think of when we associate the great lawgiver with marble, but staid and stately in full drapery. He strikes the rock of Meribah, and water exudes from its crevices into a marble basin.

Outside the circular rim of this are equidistantly arranged the rather incongruous effigies of Archbishop Carroll, his relative the Signer, Commodore Barry and Father Mathew. Each of these worthies presides over a small font designed for drinking purposes — unless that of the old sea-dog be salt. The central basin is additionally embellished with seven medallion heads of Catholics prominent in the Revolution, the selections being La Fayette, his wife, De Grasse, Pulaski, Colonel S. Moylan, Thomas Fitzsimmons and Kosciusko. The artist is Hermann Kirn, a pupil of Steinhäuser, one of the first of the modern romantic school of German sculptors. Kirn is understood to have enjoyed his instructor's aid in completing the statues in the Tyrol.

Another religious body ranges itself in the cause of art by the side of one with which it does not habitually co-operate. Dr. Witherspoon, the only clerical Signer, is its contribution in bronze. The Geneva gown supplies the grand lines lacking in the secular costume of the period, and indues the patriot with the silken cocoon of the Calvinist. The good old divine had well-cut features, which take kindly to the chisel. The pedestal is of granite.

Of other statues we shall take another occasion to speak. The tinkle of fountains leads us on to Horticultural Hall, where they give life and charm to the flowers. Painted thus in water-colors, the blossoms and leaves of the tropics glow with a freshness quite wonderful in view of the very short time the plants have been in place and the exposure they unavoidably encountered in reaching it. From the interior and exterior galleries of this exquisite structure one can look down, on one side, upon the palms of the Equator and on the other upon the beech and the fir, which interlock their topmost sprays at his feet. Beyond and beneath the silvery beeches railway-trains whisk back and forth, like hares athwart the covert — the tireless locomotive another foil to the strangers from the land of languor and repose.

HORTICULTURAL HALL—INTERIOR.

The manufacture of a torrid climate on so large a scale could not but strike the visitor as one of the most curious triumphs of ingenuity in the whole exposition. Moisture is an essential only second in importance to heat. The two must be associated to create the normal atmosphere of most of the vegetation of the central zone. Art, in securing that end, reverses the process of Nature. The heat here is supplied from below and moisture from

above, thus transposing the sun and the swamp. In summer, indeed, the sun of our locality, reinforced by glass, will as a rule furnish an ample supply of warmth. Very frequently it will be in excess, and allow the imprisoned strangers the luxury of all the fresh air they can crave. Our summer climate is in this way more favorable than that of Kew, which in turn has the advantage in winter. The inferior amount of light throughout the year and the long nights of winter in a high latitude again operate against the English horticulturists, and leave, altogether, a balance in our favor which ought to make the leading American conservatory the most successful in the world.

Standing by the marble fountain in the great hall, with its attendant vases and statuary, the visitor will not suspect that the pavement beneath his feet is underlaid by four miles of iron pipe four inches in diameter and weighing nearly three hundred tons. Through this immense arterial and venous system circulates the life-blood of the plants, hot water being the vehicle of warmth in winter. These invisible streams will flow when the brooks at the foot of the hill are sealed by frost and the plash of the open-air fountains is heard no longer.

Another current, more conspicuous and abounding—that of hurrying human feet—soon made this magnificent conservatory the centre of one of its principal eddies. A second was the Japanese head-quarters, and a third Memorial Hall. The outlandish and the beautiful in Nature and in art take chief hold of our interest. It wanders elsewhere, but reverts to what typifies the novel and the charming. From the Mongols and the palms it will drift to the granite portals that are flanked by the winged Viennese horses and the colossal figures of Minerva in the act of bridling them. Pegasus is not very worthily represented by these bronzes. The horses, however, are the better part of the two groups; the goddesses being too tall in proportion and heavy and ungraceful in build. The finer things which they sentinel, in bronze, marble or canvas, do not belong to the scope of this article. Yet we cannot postpone to the occasion of their notice in detail a tribute to him to whose energy and judgment we owe the filling of the Art Building with works fit to be there. For the accomplishment of this task the principal credit is due to John Sartain of Philadelphia, the Nestor of American engravers. But for Mr. Sartain's efforts, the studios of the best artists of America, especially, would have been much less adequately represented, while the walls would have been in danger of defacement by a flood of inferior productions. To secure the best, and the best only, of what artists and collectors could give, committees were appointed to inspect the offerings of the principal cities and select works of real merit. The difficulties in the way are appreciable only by those familiar with the diversities of feeling and opinion which are apt to make shipwreck of art-exhibitions. They were at length overcome, and American arists united in the practical measures needed to ensure them as fair a position by the side of foreign competitors as their actual merits can sustain.

It could hardly have been a recognition of carriage-making as one of the fine arts that caused the placing of an immense receptacle for such vehicles in so prominent a position near Memorial Hall. This structure stands opposite the western half of the Main Building. Combined with the annex erected for a like purpose by the Bureau of Agriculture, which covers three acres, it would seem to afford room for specimens of every construction ever placed on wheels since Pharaoh's war-chariots limbered up for the Red Sea campaign. These collections have no trifling significance as a sign of progress. They are the product of good roads, one of the surest traces of civilization. A century ago, a really good road was almost an unknown thing. So recently as half so long since one of the light equipages now so familiar to us would have been a simple impossibility. What words of ecstasy Dr. Johnson, who pronounced the height of bliss to be a drive over a turnpike of his day in a cranky post-chaise, would have applied

to a "spin" in one of these wagons, no imagination can guess.

Let us not boast ourselves over the sages who had the misfortune of living too soon. It would be falling into the same blunder Macaulay ascribed to Johnson in alleging that the philosopher thought the Athenian populace the inferiors of Black Frank his valet, because they could not read and Frank could. Our heads are apt to be turned by our success in throwing together iron, timber, stone and other dead matter. Let us remember that we are still at school, with no near prospect of graduating. Many of our contemporary nations, to say nothing of those who are to come after us, claim the ability to teach us, as their being here proves. The assumption speaks from the stiff British chimneys, the pert gables of the Swedes and the laboriously wrought porticoes of the Japanese. This is well. It would be a bad thing for its own future and for that of general progress could any one people pronounce itself satisfied with what it had accomplished and ready to set the seal to its labors.

PART VI.

THE DISPLAY—INTRODUCTORY.

FAÇADE OF THE SPANISH DIVISION, MAIN BUILDING.

ALL things being ready for their reception, how were exhibits, exhibitors and visitors to be brought to the grounds? To do this with the extreme of rapidity and cheapness was essential to a full and satisfactory attendance of both objects and persons. In a large majority of cases the first consideration with the possessor of any article deemed worthy of submission to the public eye was the cost and security of transportation. Objects of art, the most valuable and the most attractive portion of the display, are not usually very well adapted to carriage over great distances with frequent transshipments. Porcelain, glass and statuary are fragile, and paintings liable to injury from dampness and rough handling;

while an antique mosaic, like the "Carthaginian Lion," a hundred square feet in superficies, might, after resuscitation from its subterranean sleep of twenty centuries with its minutest *tessera* intact and every tint as fresh as the Phœnician artist left it, suffer irreparable damage from a moment's carelessness on the voyage to its temporary home in the New World. More solid things of a very different character, and far less valuable pecuniarily, though it may be quite as interesting to the promoter of human progress, exact more or less time and attention to collect and prepare, and that will not be bestowed upon them without some guarantee of their being safely and inexpensively transmitted. So to simplify transportation as practically to place the exposition buildings as nearly as possible at the door of each exhibitor, student and sight-seer became, therefore, a controlling problem.

In the solution of it there is no exaggeration in saying that the Centennial stands more than a quarter of a century in advance of even the latest of its fellow expositions. At Vienna a river with a few small steamers below and a towpath above represented water-carriage. Good railways came in from every quarter of the compass, but none of them brought the locomotive to the neighborhood of the grounds. In the matter of tram-roads for passengers the Viennese distinguished themselves over the Londoners and Parisians by the possession of *one*. In steam-roads they had no advantage and no inferiority. At each and all of these cities the packing-box and the passenger were both confronted by the vexatious interval between the station and the exposition building—often the most trying part of the trip. Horse-power was the one time-honored resource, in '73 as in '51, and in unnumbered years before. Under the ancient divisions of horse and foot the world and its *impedimenta* moved upon Hyde Park, the Champ de Mars and the Prater, the umbrella and the oil-cloth tilt their only shield against Jupiter Pluvius, who seemed to take especial pleasure in demonstrating their failure, nineteen centuries after the contemptuous erasure of him from the calendar, to escape his power. It was reserved for the Philadelphia Commission to bring his reign (not the slightest intention of a pun) to a close. The most delicate silk or gem, and the most delicate wearer of the same, were enabled to pass under roof from San Francisco into the Main Building in Fairmount Park, and with a trifling break of twenty steps at the wharf might do so from the dock at Bremen, Havre or Liverpool. The hospitable shelter of the great pavilion was thus extended over the continent and either ocean. The drip of its eaves pattered into China, the Cape of Good Hope, Germany and Australia. Their spread became almost that of the welkin.

Let us look somewhat more into the detail of this unique feature of the American fair.

Within the limits of the United States the transportation question soon solved itself. Five-sixths of the seventy-four thousand miles of railway which lead, without interruption of track, to Fairmount Park are of either one and the same gauge, or so near it as to permit the use everywhere of the same car, its wheels a little broader than common. From the other sixth the bodies of the wagons, with their contents, are transferable by a change of trucks. The expected sixty or eighty thousand tons of building material and articles for display could thus be brought to their destination in a far shorter period than that actually allowed. Liberal arrangements were conceded by the various lines in regard to charges. Toll was exacted in one direction only, unsold articles to be returned to the shipper free. As the time for closing to exhibitors and opening to visitors approached the Centennial cars became more and more familiar to the rural watcher of the passing train. They aided to infect him, if free from it before, with the Centennial craze. Their doors, though sealed, were eloquent, for they bore in great black letters on staring white muslin the shibboleth of the day, "1776—International Exhibition—1876." The enthusiasm of those very

hard and unimpressible entities, the railroad companies, thus manifesting itself in low rates and gratuitous advertising, could not fail to be contagious. Nor was the service done by the interior lines wholly domestic. Several large foreign contributions from the Pacific traversed the continent. The houses and the handicraft of the Mongol climbed the Sierra Nevada on the magnificent highway his patient labor had so large a share in constructing. Nineteen cars

FAÇADE OF THE EGYPTIAN DIVISION, MAIN BUILDING.

were freighted with the rough and unpromising chrysalis that developed into the neat and elaborate cottage of Japan, and others brought the Chinese display. Polynesia and Australia adopted the same route in part. The canal modestly assisted the rail, lines of inland navigation conducting to the grounds barges of three times the tonnage of the average sea-going craft of the Revolutionary era. These sluggish and smooth-going vehicles were employed for the carriage of some of the large plants and trees which enrich the horticultural department, eight boats being required to transport from New York a thousand specimens of the Cuban flora sent by a single exhibitor, M. Lachaume of Havana. Those moisture-loving shrubs, the brilliant rhododendra collected by English nurserymen from our own Alleghanies and returned to us wonderfully improved by civilization, might have been expected also to affect the canal, but they chose, with British taste, the more rapid rail. They had, in fact, no time to lose, for their blooming season was close at hand, and their roots must needs hasten to test the juices of American soil. Japan's miniature garden of miniature plants, interesting far beyond the proportions of its dimensions, was perforce dependent on the same means of conveyance.

The locomotive was summoned to the aid of foreign exhibitors on the Atlantic as on the Pacific side, though to a less striking exent, the largest steamships being able to lie within three miles of the exposition buildings. It stood ready on the wharves of the Delaware to welcome these stately guests from afar, indifferent whether they came in squadrons or alone. It received on one day, in this vestibule of the exposition, the Labrador from France and the Donati from Brazil. Dom Pedro's coffee, sugar and tobacco and the marbles and canvases of the Société des Beaux-Arts

were whisked off in amicable companionship to their final destination. The solidarity of the nations is in some sort promoted by this shaking down together of their goods and chattels. It gives a truly international look to the exposition to see one of Vernet's battle-pieces or Meissonier's microscopic gems of color jostled by a package of hides from the Parana or a bale of India-rubber.

Yet more expressive was the medley upon the covered platforms for the reception of freight. Eleven of these, each one hundred and sixty by twenty-four feet, admitted of the unloading of fifty-five freight-cars at once. At this rate there was not left the least room for anxiety as to the ability of the Commission and its employés to dispose, so far as their responsibility was concerned, of everything presented for exhibition within a very few days. The movements of the custom-house officials, and the arrangements of goods after the passing of that ordeal, were less rapid, and there seemed some ground for anxiety when it was found that in the last days of March scarce a tenth of the catalogued exhibits were on the ground, and for the closing ten days of the period fixed for the receipt of goods an average of one car-load per minute of the working hours was the calculated draft on the resources of the unloading sheds. Home exhibitors, by reason of the very completeness of their facilities of transport, were the most dilatory. The United States held back until her guests were served, confident in the abundant efficiency of the preparations made for bringing the entertainers to their side. Better thus than that foreigners should have been behind time.

When the gates of the enclosure were at last shut upon the steam-horse, a broader and more congenial field of duty opened before him. From the rôle of dray-horse he passed to that of courser. Marvels from the ends of the earth he had, with many a pant and heave, forward pull and backward push, brought together and dumped in their allotted places. Now it became his task to bear the fiery cross over hill and dale and gather the clans, men, women and children. The London exhibition of 1851 had 6,170,000 visitors, and that of 1862 had 6,211,103. Paris in 1855 had 4,533,464, and in 1867, 10,200,000. Vienna's exhibition drew 7,254,867. The attendance at London on either occasion was barely double the number of her population. So it was with Paris at her first display, though she did much better subsequently. Vienna's was the greatest success of all, according to this test. The least of all, if we may take it into the list, was that of New York in 1853. Her people numbered about the same with the visitors to her Crystal Palace—600,000. Philadelphia's calculations went beyond these proportions, and she laid her plans accordingly.

Some trainbands from Northern and Southern cities might give their patriotic furor the bizarre form of a march across country, but the millions, if they came at all, must come by rail, and the problem was to multiply the facilities far beyond any previous experience, while reconciling the maximum of safety, comfort and speed with a reduction of fares. The arrangements fully justified themselves in practice, and proved themselves equal to a greater strain than they had to encounter. There could be no serious crowding. The train was practically endless, the word *terminus* being a misnomer for the circular system of tracks to which the main station (six hundred and fifty by one hundred feet) at the main entrance of the grounds forms a tangent. The line of tourists was reeled off like their thread in the hands of Clotho, the iron shears that snip it at stated intervals being represented by the unmythical steam-engine. The same modern minister of the Fates had another shrine not far from the dome of Memorial Hall, where his acolytes were the officials of the Reading Railroad Company.

Care for the visitor's comfortable locomotion does not end with depositing him under the reception-verandah. The Commission did not forget that a pedestrian excursion over fifteen or twenty miles of aisles might sufficiently fatigue him without the additional trudge from hall to hall

over a surface of four hundred acres under a sun which the century has certainly not deprived of any mentionable portion of its heat. Hence, the belt railway, three and a half miles long, with trains running by incessant schedule—a boon only to be justly appreciated by those who attended the European expositions or any one of them. His umbrella and goloshes pocketed in the form of a D. P. C. check, the visitor, more fortunate than Brummel or Bonaparte, could not be stopped by the elements.

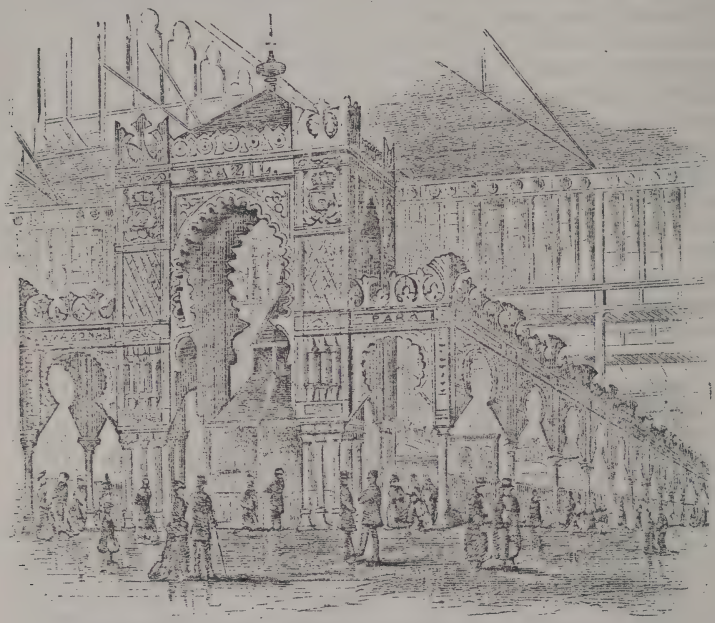
We shall have amply disposed of the subject of transportation when we add that the neighborhood or city supply to the thirteen entrance-gates was provided for by steam-roads capable of carrying twenty-four thousand persons hourly, and tram-roads seating seven thousand, besides an irregular militia or voltigeur force of light wagons, small steamers and omnibuses equal to a demand of two or three thousand more in the same time. It was not deemed likely that Philadelphia would require conveyance for half of her population every day. Should that supposition prove erroneous, the excess could fall back upon the safe and inexpensive vehicle of 1776, 1851, 1867 and 1873—sole leather.

Let us return to our packing-cases,

FAÇADE OF THE SWEDISH DIVISION, MAIN BUILDING.

and see where they go. To watch the gradual dispersal of a congregation to their several places of abode is always interesting. Especially is it so when those places of retreat bear the names and fly the flags of the several nations of the globe. This stout cube of deal, triple-bound with iron, disappears under the asp and winged sphere of the Pharaohs. That other, big with rich velvets and broideries, seeks the tricolor of France. Yonder, a wealth of silks and lacquer finds a resting-place in the carved black-walnut *étagères* of Japan. Here go, cased in the spoils of the fjelds, toward a pavilion seventy-five paces long and twenty wide, the bulky contributions of the Norsemen. Swedish carpentry in perfection offers to a deposit separate from that of the sister-kingdom a distinct receptacle. Close at hand stand the antipodes in the pavilion of Chili, that opens its graceful portal to bales sprinkled mayhap with the ashes of Aconcagua. There "crashes a sturdy *box* of stout John Bull;" and Russia, Tunis and Canada roll into close neighborhood with him and each other. A queer and not, let us hope, altogether transitory show of international comity is this. Many a high-sounding, much-heralded and more-debating Peace Congress has been held with less effect

than that conducted by these humble porters, carpenters and decorators. This one has solidity. Its elements are palpable. The peoples not only bring their choicest possessions, but they also set up around them their local habitations. It is a cosmopolitan town that has sprung into being beneath the great roof and



FAÇADE OF THE BRAZILIAN DIVISION, MAIN BUILDING.

glitters in the rays of our republican sun. In its rectangularly-planned streets, alleys and plazas every style of architecture is represented—domestic, state and ecclesiastical, ancient, mediæval and modern. The spirit and taste of most of the races and climes find expression, giving thus the Sydenham and the Hyde Park palaces in one. The reproductions at the former place were the work of English hands: those before us are executed, for the most part, by workmen to whom the originals are native and familiar. In this feature of the interior of the Main Building we are amply compensated for the breaking up of the *coup d'œil* by a multiplicity of discordant forms. The space is still so vast as to maintain the effect of unity; and this notwithstanding the considerable height of some of the national stalls, that of Spain, for example, sending aloft its trophy of Moorish shields and its effigy of the world-seeking Genoese to an elevation of forty-six feet. The Moorish colonnade of the Brazilian pavilion lifts its head in graceful rivalry of the lofty front reared by the other branch of the Iberian race. In so vast an expanse this friendly competition of Spaniards and Portuguese becomes, to the eye, a union of their pretensions; and a single family of thirty-three millions in Europe and America combines to present us with two of the handsomest structures in the hall.

A moderate dip into statistics can no longer be evaded. We must map out the microcosm, and allot to each sovereign power its quota of the surface. The great European states which have assumed within the century the supreme direction of human affairs are assigned a prominent central position in the Main Building. Great Britain and her Asiatic possessions occupy just eighty-three feet less than a hundred thousand; her other colonies, including Canada, 48,150;

France and her colonies, 43,314; Germany, 27,975; Austria, 24,070; Russia, 11,002; Spain, 11,253; Sweden and Belgium, each 15,358; Norway, 6897; Italy, 8167; Japan, 16,566; Switzerland, 6646; China, 7504; Brazil, 6397; Egypt, 5146; Mexico, 6504; Turkey, 4805; Denmark, 1462; and Tunis, 2015. These, with minor apportionments to Venezuela, the Argentine Confederation, Chili, Peru and the Orange Free State of South Africa, cover the original area of the structure, deducting the reservation of 187,705 feet for the United States, and excluding thirty-eight thousand square feet in the annexes. France must be credited, in explanation of her comparatively limited territory under the main roof, with her external pavilions devoted to bronzes, glass, perfumery and (chief of all) to her magnificent government exhibit of technical plans, drawings and models in engineering, civil and military, and architecture. These outside contributions constitute a link between her more substantial displays and the five hundred paintings, fifty statues, etc. she places in Memorial Hall.

In Machinery and Agricultural Halls, respectively, Great Britain has 37,125 and 18,745 feet; Germany, 10,757 and 4875; France, 10,139 and 15,574; Belgium, 9375 and 1851; Canada, 4300 and 10,094; Brazil, 4000 and 4657; Sweden, 3168 and 2603; Spain, 2248 and 5005; Russia, 1500 and 6785; Chili, 480 and 2493; Norway, 360 and 1590. Austria occupies 1536 feet in Mechanical Hall; and in that of Agriculture are the following additional allotments: Netherlands, 4276; Denmark, 836; Japan, 1665; Peru, 1632; Liberia, 1536; Siam, 1220; Portugal, 1020.

The foreign contributions in the department of machinery are, it will be seen, hardly so large as might have been anticipated. When the spacious annexes are added to the floor of the main hall, the great preponderance of home exhibitors—five to one in the latter—is shown to be still more marked. In Agricultural Hall the United States claimed less than two-thirds. The unexpected interest taken in this branch by foreigners much enhanced its prominence and value among the attractions of the exposition. The collection of tropical products for food and manufacturing is very complete. The development of the equatorial regions of the globe has barely commenced. Even

DOM PEDRO, EMPEROR OF BRAZIL.

our acquaintance with their natural resources remains but superficial. The country which takes the lead in utilizing them in its trade and manufactures will gain a great advantage over its fellows. England's commercial supremacy never rested more largely on that foundation than now. Brazil, the great power of South—as the Union is of North—America, possesses nearly half of the accessible virgin territory of the tropics. Our interest joins hers in retaining this vast endowment as far as possible for the benefit of the Western World. A perception of this fact is shown in the exceptional efforts made by Brazil to be fully represented in all departments of the exposition, and in the visit to it of her chief magistrate, as we may properly term her emperor, the only embodiment of hereditary power and the monarchical principle in a country that enjoys—and has for the half century since its erection into an independent state maintained—free institutions.

In art domestic exhibits utterly lose

their preponderance. Our artists content themselves with a small fraction of the wall- and floor-space in Memorial Hall and its northern annex. In extent of both "hanging" and standing ground they but equal England and France, each occupying something over twenty thousand square feet. Italy in the æsthetic combat selects the chisel as her weapon, and takes the floor with a superb array of marble eloquence, some three hundred pieces of statuary being contributed by her sculptors. She might in addition have set up a colorable claim to the works executed on her soil or under the teaching of her schools by artists of other nativities, and thus make, for example, a sweeping raid into American territory. But she generously left to that division the spoils swept from her coasts by the U. S. ship Franklin, together with the works bearing her imprint in other sections, satisfied with the wealth undoubtedly her own, itself but a faint adumbration of the vast hoard she retained at home. Italy did not view the occasion from a fine-art standpoint alone. Of her nine hundred and twenty-six exhibitors, only one-sixth were in this department.

JAPANESE CARPENTERS.

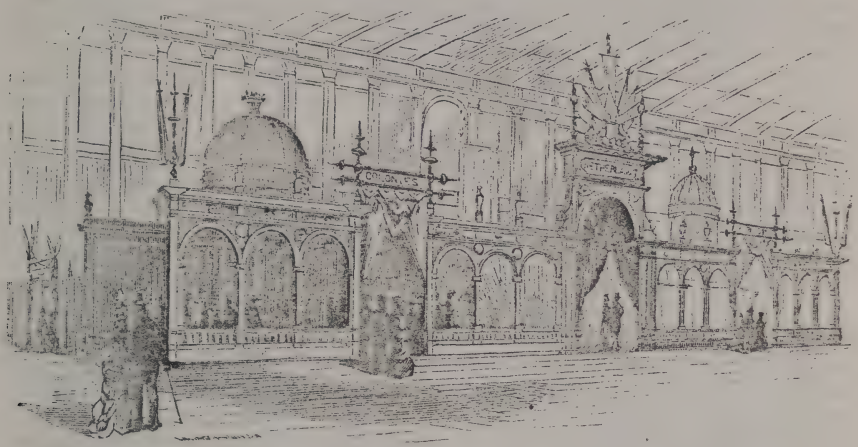
Nor, on the art side of our own country, must we overlook the Historical division, the perfecting of which was such a labor of love with Mr. Etting. He allotted space among the old Thirteen, and reserved a place at the feast of reunion to the mother of that rebellious sisterhood.

Forty acres of "floor-space" *sub Jove* remained to be awarded to foreign and domestic claimants. Gardening is one of the fine arts. Certainly nothing in Memorial Hall can excel its productions in richness, variety and harmony of color and form. Flower, leaf and tree are the models of the palette and the crayon. Their marvelous improvement in variety and splendor is one of the most striking triumphs of human ingenuity. A few hundred species have been expanded into many thousand forms, each finer than the parent. It is a new flora created by civilization, undreamed of by the savage, and voluminous in proportion to the mental advancement of the races among whom it has sprung up. Progress writes its record in flowers, and scrawls the autographs of the nations all over Lansdowne hill. No need of gilded show-cases to set off the German and Germantown roses, the thirty thousand hyacinths in another compartment, or the plot of seven hundred and fifty kinds of trees and shrubs planted by a single American contributor. The Moorish Kiosque, however, comes in well. The material is genuine Morocco, the building having been brought over in pieces from the realm of the Saracens, of "gul in its bloom" and of "Larry O'Rourke"—as Rogers punned down the poem of his Irish friend.

The nations comfortably installed, we must sketch the tactical system under which they are drawn up for peaceful contest. The classification of subjects adopted by the Commission embraced seven departments. Of these, the Main Building is devoted to I. *Mining and Metallurgy*; II. *Manufactures*; III. *Education and Science*; Memorial Hall and its appendages, to IV. *Art*; Machinery Hall, to V. *Machinery*; Agricultural Hall, to VI. *Agriculture*; and Horticultural Hall and its parterres, to VII. *Horticulture*. These habitats, however, as we have heretofore seen, proved too contracted for the august

and expansive inmates assigned them. All of the latter soon overflowed; mining, for instance, into the mineral annex of thirty-two thousand square feet and the great pavilion (a hundred and thirty-five feet square) of Colorado and Kansas; education into the Swedish and Pennsylvania school-houses and others already noted; manufactures into breweries, glass-houses, etc.; and so on with an infinity of irrepressible outgrowths.

Department I. is subdivided into classes



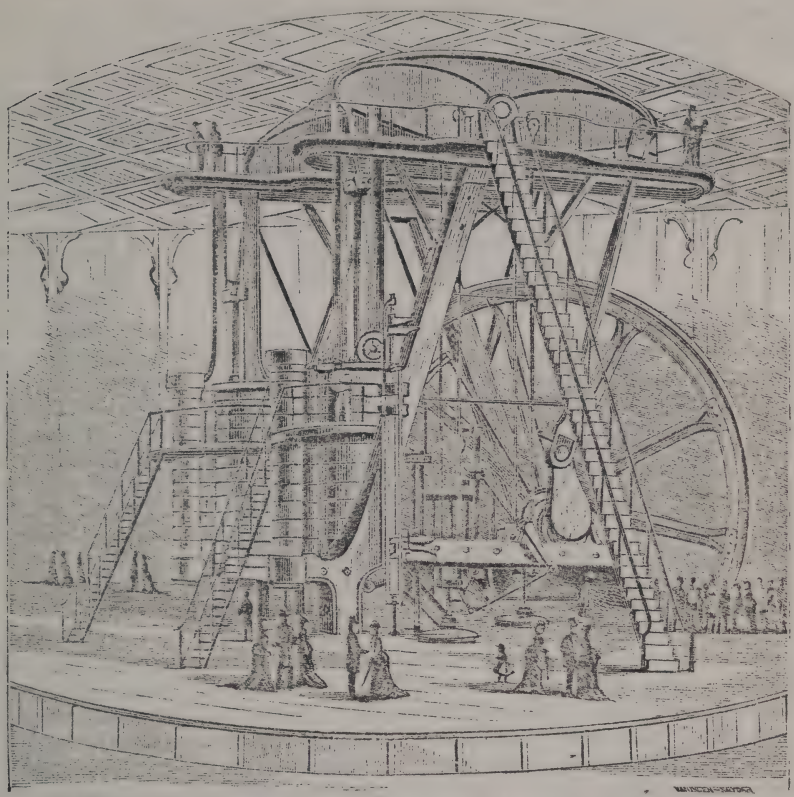
FAÇADE OF THE DIVISION OF THE NETHERLANDS, MAIN BUILDING.

numbered from 100 to 129, and embracing the products of mines and the means of extracting and reducing them. II. extends from Class 200 to Class 296—chemical manufactures, ceramics, furniture, woven goods of all kinds, jewelry, paper, stationery, weapons, medical appliances, hardware, vehicles and their accessories. III. deals with the high province of educational systems, methods and libraries; institutions and organizations; scientific and philosophical instruments and methods; engineering, architecture in its technical and non-æsthetic aspect, maps; physical, moral and social condition of man. Fifty classes, 300 to 349 inclusive, fence in this field of pure reason. Department IV., Classes 400–459, covers sculpture, painting, photography, engraving and lithography, industrial and architectural designs, ceramic decorations, mosaics, etc. V., Classes 509–599, takes charge of machines and tools for mining, chemistry, weaving, sewing, printing, working metal, wood and stone; motors; hydraulic and pneumatic apparatus; railway stock or "plant;" machinery for preparing agricultural products; "aërial, pneumatic and water transportation," and "machinery and apparatus especially adapted to the requirements of the exhibition." VI., Classes 600–699, assembles arboriculture and forest products, pomology, agricultural products, land and marine animals, pisciculture and its apparatus, "animal and vegetable products," textile substances, machines, implements and products of manufacture, agricultural engineering and administration, tillage and general management. Under Department VII., Classes 700–739, come ornamental trees, shrubs and flowers, hothouses and conservatories, garden tools and contrivances, garden designing, construction and management.

The accumulated experience of past expositions, seconded by the judgment and systematic thoroughness apparent in the preparations for the present one, made this a good "working" classification. It put an end to confusion to an extent hardly to have been hoped for, and all the thousands of objects and subjects dropped smoothly into their places in the exhibition with the pre-

cision of machinery, little adapted as some of them were to such treatment. Very impalpable and elusive things had to submit themselves to inspection and analysis, and have their elements tabulated like a tax bill or a grocery account. All human concerns were called on to be listed on the muster-roll and stand shoulder to shoulder on the drill-ground. Some curious comrades appear side by side in the long line. For example, we read: Class 286, brushes; 295, sleighs; 300, elementary instruction; 301, academies and high schools, colleges and universities; 305, libraries, history, etc.; 306, school-books, general and miscellaneous literature, encyclopædias, newspapers; 311, learned and scientific associations, artistic, biological, zoological and medical schools, astronomical observatories; 313, music and the drama. Then we find, closely sandwiched between, 335—topographical maps, etc.—and 400—figures in stone, metal, clay or plaster—340, physical development and condition (of the young of the genus *Homo*); 345, government and law; 346, benevolence, beginning with hospitals of all kinds and ending with—in the order we give them—emigrant-aid societies, treatment of aborigines and prevention of cruelty to animals! In the last-named subdivision the visitor was stared out of countenance by Mr. Bergh's tremendous exposure of "various instruments used by persons in breaking the law relative to cruelty to animals," the glittering banner of the S. P. C. A., and its big trophy, eight yards square, illuminating the east end of the north avenue of the Main Building in opposition to the trophy at the other end of the same avenue illustrating the history of the American flag. But he would look in vain for selected specimens of the emigrant-runner, the luxuries of the steerage and Castle Garden, or for photographs of the well-fed post-trader and Indian agent, agricultural products from Captain Jack's lava-bed reservation and jars of semi-putrescent treaty-beef. He alighted, next door to the penniless immigrant, the red man and the omnibus-horse, on Class 348, religious organizations and systems, embracing everything that grows out of man's sense of responsibility to his Maker. It may perhaps occur to the observer that, though the juxtaposition is well enough, religion ought to have come in a little before. His surprise at the power of condensation shown in compressing eternity into a single class will not be lessened when he passes on to Class 632, sheep; 634, swine; and 636, dogs and cats!

A glance over the classification-list assists us in recognizing the advantages of the system of awards framed by the Commission and adopted after patient study and discussion. It discards the plan—if plan it could be called—of scattering diplomas and medals of gold, silver and bronze right and left, after the fashion of largesse at a mediæval coronation, heretofore followed at international expositions. These prizes were decided on and assigned by juries whose impartiality—by reason of the imperfect representation upon them of the nations which exhibited little in mass or little in certain classes, and also of their failure to make written reports and thus secure their responsibility—could not be assured, and whose action, therefore, was defective in real weight and value. The juries were badly constituted: they had too much to do of an illusory and useless description, and they had too little to do that was solid and instructive. Special mentions, diplomas, half a dozen grades of medals and other honors, formed a programme too large and complicated to be discriminatingly carried out. So it happened that to exhibit and to get a distinction of some kind came, at Vienna, to be almost convertible expressions; and who excelled in the competition in any of the classes, or who had contributed anything substantial to the stock of human knowledge or well-being, remained quite undetermined. What instruction the display could impart was confined to spectators who studied its specialties for themselves and used their deductions for their individual advantage, and to those who read the sufficiently general and cursory reports made to their several governments by the national commissions. The official



THE CORLISS ENGINE, FURNISHING MOTIVE-POWER FOR MACHINERY HALL.

awards and reports of the exposition authorities amounted to little or nothing.

A sharp departure from this practice was decided on at the Centennial. Two hundred judges, of undoubted character and intelligence and entire familiarity with the departments assigned to them, were chosen—half by the foreign bureaus and half by the U. S. Commission. These were made officers of the exposition itself, and thus separated from external influences. They were given a reasonable and fixed compensation of one thousand dollars each for their time and personal expenses. An equal division of the number of judges between the domestic and foreign sides gives the latter an excess, measured by the comparative extent of the display from the two sources. But this is favorable to us, as we shall be the better for an outside judgment on the merits of both our own and foreign exhibits. Were it otherwise, the excess of private observers from this country would counterbalance our deficit in judges. The foreign jurors have to see for the millions they represent. Our own are aided by vast numbers of their constituents on the ground.

Written reports are drawn up by these selected examiners and signed by the authors. The reports must be "based upon inherent and comparative merit. The elements of merit shall be held to include considerations relating to originality, invention, discovery, utility, quality, skill, workmanship, fitness for the purpose intended, adaptation to public wants, economy and cost." Each report, upon its completion, is delivered to the Centennial Commission for award and publication. The award comes in the shape of a diploma with a bronze medal and a special report of the judges

upon its subject. This report may be published by the exhibitor if he choose. It might also be used by the Commission in such manner as might best promote the objects of the exposition. These documents, well edited and put in popular form, will constitute the most valuable publication that has been produced by any international exhibition. To this we may add the special reports to be made by the State and foreign commissions. These ought, with the light gained by time, to be at least not inferior to the similar papers scattered through the bulky records of previous exhibitions. Let us hope that brevity will rule in the style of all the reports, regular and irregular. There is a core to every subject, every group of subjects and every group of groups, however numerous and complex: let all the scribes labor to find it for us. When we recalled the disposition of all committees to select the member most fecund of words to prepare their report, we were seized with misgivings—a feeling that became oppressive with the further reflection that the local committee which deliberately collected and sent for exhibition eighty thousand manuscripts written by the school-children of a Western city was at large on the exposition grounds.

The passion for independent effort characteristic of the American people led to the supplementing of the official list by sundry volunteer prizes. These were offered by associations, and in some cases individuals. They are not all, like the regular awards, purely honorary. They lean to the pecuniary form, those particularly which were offered in different branches of agriculture. Competition among poultry-growers, manufacturers of butter, reaping- and threshing-machines, cotton-planters, etc. was stimulated by money-prizes reaching in all some six or eight thousand dollars. Agricultural machinery needs the open field for its proper testing, and could not operate satisfactorily in Machinery Hall. Without a sight of our harvest-fields and threshing-floors foreigners would carry away an incomplete impression of our industrial methods, the farm being our great factory. The oar, the rifle and the racer are as impatient of walls as the plough and its new-fangled allies. They demanded elbow-room for the display of their powers, and the Commission was fain to let their votaries tempt it to pass the confines of its territory. The lusty undergraduates of both sides of Anglo-Saxondom escorted it unresistingly down from its airy halls to the blue bosom of the Schuylkill, while "teams" picked from eighty English-speaking millions beckoned it across the Jerseys to Creedmoor. And the horse—was he to call in vain? Was a strait-laced negative from the Commission to echo back his neigh? Was the blood of Eclipse and Godolphin to stagnate under a ticket in "Class 630, horses, asses and mules"? Why, the very ponies in front of Memorial Hall pull with extra vim against their virago jockeys and flap their little brass wings in indignation at the thought. The thoroughbred must be heard from, and the judges that sit on him must be "experts in their department."

Another specimen of the desert-born, the Western Indian, formed an exhibit as little suited as the improved Arab horse to discussion and award at a session fraught with that "calm contemplation and poetic ease" which ought to mark the deliberations of the judges. How were the representatives of fifty-three tribes to be put through their paces? These poor fragments of the ancient population of the Union have, if we exclude the Cherokees and Choctaws and two or three of the Gila tribes, literally nothing to show. The latter can present us with a faint trace of the long-faded civilization of their Aztec kindred, while the former have only borrowed a few of the rudest arts of the white, and are protected from extinction merely by the barrier of a frontier more and more violently assailed each year by the speculator and the settler, and already passed by the railway. If we cannot exactly say that the Indian, alone of all the throng at the exhibition, goes home uninformed and unenlightened, what ideas may reach his mind will be soon smothered out by the conditions which surround him on the Plains. It is singular that a population of three

INTERIOR OF COOK'S WORLD'S TICKET-OFFICE.

or four hundred thousand, far from contemptible in intellectual power, and belonging to a race which has shown itself capable of a degree of civilization many of the tribes of the Eastern continents have never approached, should be so absolutely an industrial cipher. The African even exports mats, palm-oil and peanuts, but the Indian exports nothing and produces nothing. He lacks the sense of property, and has no object of acquisition but scalps. Can the assembled ingenuity of the nineteenth century, in presence of this mass of waste human material, devise no means of utilizing it? There stands its Frankenstein, ready made, perfect in thews and sinews, perfect also in many of its nobler parts. It is not a creation that is demanded—simply a remodeling or expansion. For success in this achievement the United States could afford to offer a pecuniary prize that will throw into the shade all the other prizes put together. The cost of the Indian bureau for 1875–76 reached eight millions of dollars. The commission appointed to treat for the purchase of the Black Hills reports that the feeding and clothing of the Sioux cost the government thirteen millions during the past seven years; and that without the smallest benefit to those spirited savages. Says the report: "They have made no advancement whatever, but have done absolutely nothing but eat, drink, smoke and sleep."

Social and political questions like this point to a vast field of inquiry. For its proper cultivation the exposition provided data additional to those heretofore available. They should be used as far as possible upon the spot. At least, they could be examined, collated and prepared for full employment. To this end, meetings and discussions held by men qualified by intellect and study to deal with them are the obvious resort. There is room among the two hundred judges for some such men, but the juries are little more numerous than is required for the examination of and report on objects. For more abstract inquiries they will need recruits. These should be supplied by the leading philosophical associations of this country and Europe. The governments have all an interest in enlisting their aid, and the Centennial Commission has done what in it lay to promote their action. Ethnic

characteristics, history, literature, education, crime, statistics as a science, hygiene and medicine generally are among the broad themes which are not apt to be adequately treated by the average committee of inspection. So with the whole range of the natural sciences. Dissertations based on the jury reports will doubtless be abundant after a while, but those reports themselves, being limited in scope, will not be as satisfactory material as that which philosophic specialists would themselves extract from direct observation and debate upon the ground.

For the study of the commanding subject of education the provision made at the present exhibition is exceptionally great. In bulk, and probably in completeness, it is immeasurably beyond the display made on any preceding occasion. The building erected by the single State of Pennsylvania for her educational department covers ten or eleven thousand square feet, and other States of the Union make corresponding efforts to show well in the same line. The European nations all manifest a new interest in this branch, and give it a much more prominent place in their exhibit than ever before. The school-systems of most of them are of very recent birth, and do not date back so far as 1851. The kingdom of Italy did not exist at that time or for many years after, yet we now see it pressing for a foremost place in the race of popular education, and multiplying its public schools in the face of all the troubles attendant upon the erection and organization of a new state.

The historian will find aliment less abundant. A century or two of Caucasian life in America is but a thing of yesterday to him, and, though far from uninstructive, is but an offshoot from modern European annals. For all that, he finds himself on our soil in presence of an antiquity which remains to be explored, and which clamors to be rescued from the domain of the pre-historic. It has no literary records beyond the scant remains of Mexico. It writes itself, nevertheless, strongly and deeply on the face of the land—in mounds, fortifications and tombs as distinct, if not so elaborate, as those of Etruria and Cyprus. These remains show the hand of several successive races. Who they were, what their traits, whence they came, what their relations with the now civilized Chinese and Japanese — whom, physically, their descendants so nearly resemble—are legitimate queries for the historian. Geologically, America is older than Europe, and was fitted for the home of the red man before the latter ceased to be the home of the whale. The investigation of its past, if impossible to be conducted in the light of its own records or even traditions, is capable of aiding in the verification of conclusions drawn from those of the Old World. If History, however, contemptuously relegates the Moundbuilders to the mattock of the antiquarian, she is still "Philosophy teaching by example." As thus allied with Philosophy, she finds something to look into at the Centennial, even though she look obliquely, after the fashion of the observant Hollanders, who inserted the reflecting glasses of the Dutch street-windows into the sides of their compartment in the Main Building, and squinted without a change of position, upon the United States, Spain, South America, Egypt, Great Britain and several other countries.

Religion and philanthropy find the field inviting, and their representatives, individual and associated, are busy in preparing to till it. The enthusiasm of the leading religious societies took the concrete shape of statuary. Hence the Catholic Fountain, heretofore noticed; the Hebrew statue to Religious Liberty, as established in a land that never had a Ghetto or a Judenstrasse; the Presbyterian figure of Witherspoon; an Episcopalian of Bishop White; and others under way or proposed. The temperance movement, too, embodied itself in a fountain that runs ice-water instead of claret. The less tangible but perhaps more fruitful form of reunions and discussions must in a greater or less degree enhance the power for good of these organizations. They are led by men of mind and energy, seldom averse to enlightenment, and all professing to seek nothing else.

When men of these qualities, aiming at the same or a like object, meet to compare their respective admeasurements of its parallax made from as many different points, they cannot fail to approach accuracy. Faith is a first element in all great undertakings. It removes mountains at Mont Cenis, as it walked the waves with Columbus. In our century even faith is progressive, and does not shrink from elbowing its way through what Bunyan would have styled Vanity Fair.

Modestly in the rear of the moral reformers, yet not wholly and uniformly unaggressive, nor guiltless altogether of isms and schisms, step forward the literary men. As a rule, they do not affect expositions, or exhibitions of any kind. But one general meeting, with some minor and informal ones, was on the programme for them. This is well. The world and the fullness thereof belongs to them, and they would naturally come forward to scan this schedule of their inheritance. We do not hear of their having combined to put up a pavilion of their own, like the dairymen and the brewers, "to show the different processes of manufacture." The pen was at work here, nevertheless, and has been from the beginning, before the foundations of the Corliss engine were laid or the granite of Memorial Hall left the quarry. Without this first of implements none of the other machinery would ever have moved. The pen is mightier than the piston. It is the invisible steam that impels all.

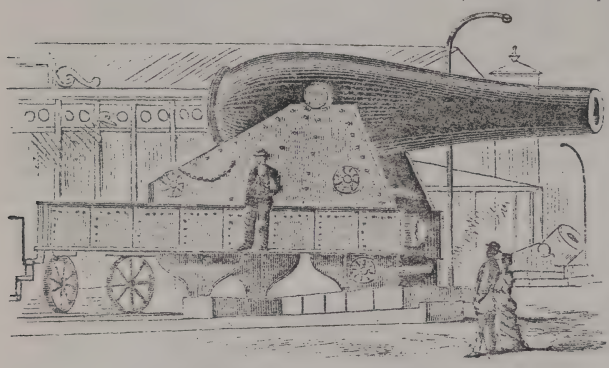
In a visible form also it is here. The publishers of the London *Punch* selected as the most comprehensive motto for the case in which they exhibit copies of their various publications a sentence from Shakespeare: "Come and take choice of all my library, and so beguile thy sorrow." We do not know that to dull his sorrows is all that can be done for man. Literature assumes to do more than make him forget. The lotos-eater is not its one hero. School-books, piled aloft "in numbers without number numberless," may to the man be suggestive of hours without thought and void of grief, but they certainly are not to the boy. Blue books, ground out in a thousand bureaus, and contributed in like profusion, may be pronounced a weariness to the adult flesh, however sweet their ultimate uses. Unhappy those who wade through them for increasing the happiness of others! These humble but portly representatives of political literature are the log-books of the ship of state. They chart and chronicle the currents and winds along its course,

FRENCH RESTAURANT LA FAYETTE.

so that from the mass of chaff a grain of guidance may be painfully winnowed out for the benefit of its next voyage, or for the voyages of other craft floundering on the same perilous and baffling sea. Everything comes pat to a log-book. As endless is the medley of memoranda in blue-books. They deal, like government itself, with everything. They take up the citizen on his entry into the cradle, and do not quite drop him at the grave. How to educate, clothe, feed and doctor him; how to keep him out of jail, and how, once there, to get him out again with the least possible moral detriment; how to adjust as lightly as possible to his shoulders the burden of taxation; how to economize him as food for powder; and how to free him from the miasm of crowded cities,—are but a small part of their contents. And the index is growing, if possible, larger, as the apparatus of government becomes more and more intricate. With such contributions and credentials do the rulers of the nations enroll

themselves in the guild of authorship. They are proud of them, and exhibit them in profusion, in whole libraries, rich with gold and the primary colors.

Expositions, as we have before remarked, come into the same worshipful guild by right of a special literature they have brought into being. They come, moreover, into the blue-book range by their bearing upon certain topics generally assigned to it. It is found, for example, that, like other great gatherings, they are apt to be followed by a temporary local increase of crime. The police-records of London show that the arrests in 1851 outnumbered those of the previous year by 1570, and that in 1862 the aggregate exceeded by 5043 that of 1861. It will at once occur that the population of the city was greatly increased on each occasion, and that the influx of thieves and lawbreakers generally must have thinned out that class elsewhere, and in that way very probably reduced, rather than added to, the sum-total of crime, the preventive arrangements in London having been exceptionally thorough. The drawback that would consist in an increase of crime is therefore only an apparent result. An opposite effect cannot but result, if only from the evidence that so vast and heterogeneous an assemblage can be held without marked disorder. The police as well as the criminals and the savants of all nations come together, compare notes and enjoy a common improvement.



THE MAMMOTH RODMAN GUN.

This was the first opportunity the physicians of Europe had to become fully acquainted with the advances in surgery and pathology their American brethren have the credit of having made within the past few years. They found it illustrated in the government buildings and elsewhere; and they had an ample *quid pro quo* to offer from their own researches. The balancing of opinions at the proposed medical congress and in private intercourse must tend to free medical science from what remnants of empiricism still disfigure it, to perfect diagnosis and to trace with precision the operation of all remedial agents. Means remain to be found of administering the *coup de grâce* to the few epidemics which have not yet been extirpated, but linger in a crippled condition. This will be aided by the illustrations afforded of processes of draining, ventilation, etc.

Man's health rests in that of his stomach. The food question is a concern of the physician as well as of the publicist. The race began life on a vegetable diet, and to that it reverts when compelled by enfeebled digestion or by the increasing difficulty of providing animal food for a dense population. But it likes flesh when able to assimilate it or to procure it, and demands at least the compromise of fish. Hence, the revived attention to fish-breeding, an art wellnigh forgotten since the Reformation emptied the carp-ponds of the monks. Maryland, New York and other States illustrate this device for enhancing the food-supply, and the aquaria at Agricultural Hall, containing twelve or fifteen thousand gallons of salt and fresh water, present a congress of the leaders, gastronomically speaking, of the finny people. The shad remains not only to be naturalized in Europe, but to be reintroduced to the water-side dwellers above tide, who

once met him regularly at table. He is joined by delegates from the mountain, the great lakes and the Pacific coast in the trout, the salmon and the whitefish, and by that quiet, silent and slow-going cousin of the fraternity, the oyster, most valuable of all, as possessors of those qualities not unfrequently are. Europe does not dream, and we ourselves do not realize until we come carefully to think of it, what the oyster does for us. He sustains the hardiest part of our coasting marine, paves our best roads, fertilizes our sands, enlivens all our festivities, and supports an army of packers, can-makers, etc., cased in whose panoply of tin he traverses the globe like a mail-clad knight-errant in the cause of commerce and good eating. Yet he needs protection. All this burden is greater than he can bear, and it is growing. System and science are invoked to his rescue ere he go the way of the inland shad and the salmon that became a drug to the Pilgrim Fathers. It is not easy to frame a medal or diploma for the fostering of the oyster. More effective is a consideration of the impending penalty for neglecting to do so. *Ostrea edulis* is one of the grand things before which prizes sink into nothingness.

Another of them is that triumph of pure reason, chess, an unadulterated product of the brain—*i. e.*, of phosphorus—*i. e.*, of fish. Nobody stakes money on chess or offers a prize to the best player. Honor at that board is its own reward. So when we are told of the Centennial Chess Tournament we recognize at once the fitness of the word borrowed from the chivalric joust. It is the culmination of human strife. The thought, labor and ardor spread over three hundred and fifty acres sums itself in that black and white board the size of your handkerchief. War and statecraft condense themselves into it. Armies and nations move with the chessman. Sally, leaguer, feint, flank-march, triumphant charge are one after another rehearsed. There, too, moves the game of politics in plot and counterplot. It is the climax of the subjective. From those lists the trumpet-blare, the crowd, the glitter, the banners, "the boast of heraldry and pomp of power," melt utterly away. To

SCENE AT ONE OF THE ENTRANCES TO THE GROUNDS—THE TURNSTILE.

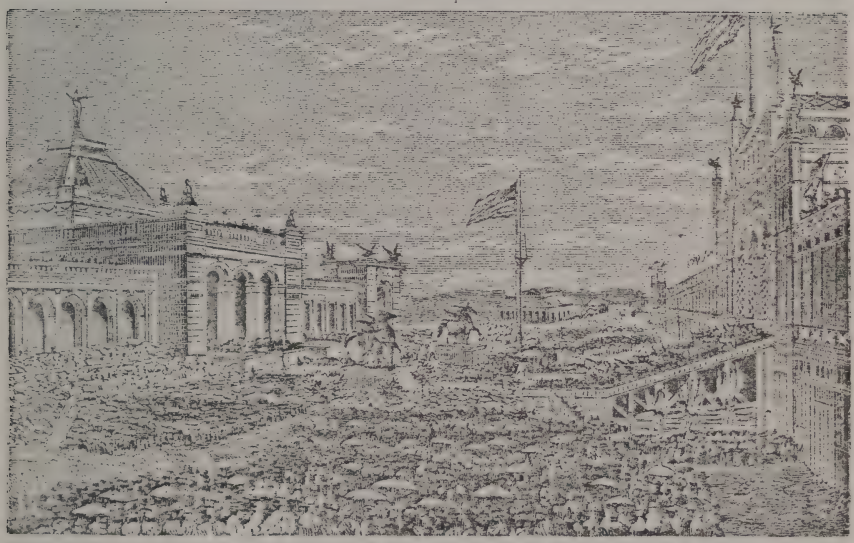
the world-champions who bend above the little board the big glass houses and all the treasures stared at by admiring thousands are as naught.

But man is an animal, and not by any means of intellect all compact. The average mortal confesses to a craving for the stimulus of great shows, of material purposes, substantial objects of study and palpable prizes. It is so in 1876, as it was in 1776, and as it will be in a long series of Seventy-sixes.

It is the concrete rather than the abstract which draws him in through the turnstiles of the exposition enclosure. Separated by the divisions of those ingeniously-contrived gates into taxed and untaxed spectators, the masses stream in with small thought of the philosophers or the chess-players. Their minds are reached, but reached through the eye, and the first appeal is to that. Each visitor constitutes himself a jury of one to consider and compare what he sees. The hundreds of thousands of verdicts so reached can be published only by word of mouth, if published at all. Their value will be none the less indubitable, though far from being in all cases the same. The proportion of intelligent observers has been greater than on like occasions heretofore. So has, perhaps, that of solid matter for study, although in some specialties there may be default. He who entered with the design of self-education found the text-books in most branches abundant, wide open before him and printed in the clearest characters. What shortcomings there may have been in the selection and arrangement of them he will have, if he can, himself to remedy. There stands the school, founded and furnished with great labor. The would-be scholar can only be invited to use it. The centennial that is to turn out scholars ready-made has not yet rolled round.

PART VII.

IN THE MAIN BUILDING.



SCENE OF THE OPENING CEREMONIES.

MAY is a pleasant month to look forward to or back upon—bright alike in anticipation and in retrospect, comely from front, rear or centre, past, future and present. She seldom disappoints us, for the flowers must come, and they must come very nearly at their appointed time. Their gentle will forces a way. They are sure to frame for us between April and June a graceful bridge over the chasm from frost to fruit. No failure of contractors or blunder in the estimates ever prevents or materially postpones the construction of that viaduct. It provides an element of certainty for men's calculations of movement, individual, political,

military and industrial. Glebe and sea and river open before plough and keel. All the industries but that of the ice-gatherer leap to new life, and even the ice-man begins really to reap the golden harvest he has planted in sawdust.

The month bids fair to earn a new distinction, and to gain for a title "the month of international expositions." Ordinary fairs come in midsummer and midfall, and, Church and charity supplying the motive, midwinter. A few days or weeks is time enough for them. They say their short say and disappear, like the sparrow twittering for a moment on the hedge, very different from the eagle, perched high and long, "ringed with the azure world" and all its wealth. Thus stand the great shows of the empires, borne from afar to a prominent spot and there remaining from solstice to solstice. Ponderous bodies, as some profound philosopher long ago informed mankind, move slowly and are slow to start. These exhibitions have assumed, as their normal demand on time, three years for preparation and six months of bloom. May and November limit their perfected existence. But they are not always nominally punctual to the appointed time of opening, true as that inexorable janitor, Winter, compels them to be to the closing date.

In this point of punctuality to inauguration-day the Centennial distinguished itself. The commission presented its buildings and their appurtenances complete and ready for the reception of contributions and visitors. In the Main Building the great mass of the exhibits was on the ground, most of them in place and fully displayed. So it was, to a less marked extent, in Machinery and Agricultural Halls. In the Art Hall the bulk of the objects remained unpacked —a circumstance in some degree justified by the liability of oil-paintings to injury from the dampness of walls erected during the previous winter. With the advance of warm weather this unavoidable drawback, for which neither managers nor exhibitors were to blame, was rapidly overcome. Practically, the interval during which the show-cases in the other three structures remained unoccupied after the opening was not lost to the visitor, who had in what was in place abundance to occupy his time. Of the backward nations—Russia, France, China, Belgium and one or two others—all save the first had part of their contributions exposed on the opening day, the array of the countries being thus with scarce a gap, although each and all were not yet in full force.

It was remarked that the American section, the floors of which, covering over a fourth of the Main Building, were a fortnight before more vacant than almost any other quarter, was filled and fitted up so rapidly as to present itself among the most finished on the 10th of May. This was not, of course, wholly due to the superior briskness of our artisans and other business-people in an emergency. They were nearer than the rest, were able more perfectly to organize and prepare beforehand, and had more thoroughly at command and under comprehension the means of perfecting their display. It is questionable, too, whether it was not really an advantage that visitors could see at once the workmen and the works of different nations—their methods, tools and habits of labor. Certainly, the Chinese department was made all the more attractive by the daily proceedings of the patient and clever operatives who slowly built up an epitome of the Flowery Land out of so unpromising a medley of red and gilded beams, matting and bamboo. And the opposite extreme of what we call civilization was not discredited by the military precision and *aplomb*, refusing to be either hastened or impeded, with which the French marshaled into ranks of uniform pavilions the glories of their taste and invention. Germans, English and Japanese, too, were to be seen at work side by side—a much less common spectacle than that of their products arranged on neighboring shelves.

In no sense, therefore, could the inaugural ceremonies be likened to saying grace over an empty or poorly-furnished board. What they were designed to honor was a long way beyond them if

we measure them by their pomp and glitter; in which respect they bore, of course, no comparison with the French and Austrian pageants on the like occasions. But great military displays, however attractive even in republican eyes, have no proper representative part in our public ceremonials, and in the present instance the simplicity of the show was in keeping with the good taste which marked all the proceedings, and with the admirable demeanor which, despite

VIEW OF THE INTERIOR OF THE MAIN BUILDING.

some faultiness in the arrangements for its comfort, characterized the vast throng of spectators. The speeches were neither prolix nor bombastic, and were subject only to the inevitable disadvantage of being inaudible beyond the nearest rows of listeners; the music was as effective as any feasible combination of harmonious sounds directed into illimitable space could hope to be; and the fitting climax was reached when, headed by the chiefs of the two great Western empires, the crowd moved slowly upon Mr. Corliss's works, and the noiseless throbbing of the colossal engine signaled the risen curtain and dissolved the compact multitude into eddying streams of diligent observers.

Let us return to the junction of nave and transept, where, in a rotunda of a hundred feet height and diameter, the four countries, Germany, France, England and the United States, meet face to face in friendly rivalry.

Looking to the north-west, we are confronted by Great Britain at the head of her large family of colonial infants, weanlings and striplings that stretch behind her, like *Punch's* "ninety-nine misfortunes," toward the western end of the Main Building. She does not wear today her lion guise, but smoothes its terrors into Messrs. Elkington's forms of beauty. And well do these specimens of the British renaissance of the mid-nineteenth century sustain the responsibility imposed by their position in the forefront of England's exhibit. The forms in silver and glass are devoid of the heaviness formerly characteristic of English designs, and show clearly the influence of the art-schools established within the past few decades. As illustrative further of this we may point to the decorative objects in brass and bronze by Cox & Sons and Hart, Son, Peard & Co. Their hammered iron and brass add a third field of art-industry in metal

to the more common cast and repoussé work, and point to a renewal of the contest of hand against machine. It is here occupied chiefly by church furniture, and the fidelity of execution is as yet rather in advance of the merits of the designs, these being hampered by mediæval traditions. Barnard's wrought-iron gates, pavilions, palisades, etc. carry us out of the sacred precincts, and bring this class of art to the lawn and the fireside. Among this group of carvings—as they may all be called—in iron, brass and wood, we come upon the new metal, phosphor-bronze, at present chiefly limited to steam-fittings, but too delicate in grain to remain long unemployed for a higher class of work.

In glass, England is not adequately represented. Nor were we impressed very favorably by the embroideries of the Royal School of Art-Needlework. Various in merit, like other school-collections, the highest hardly attain the level of respectable mediocrity. They lead us to upholstery, a more massive branch of the ornamental, and one in which Shoolbred, James & Co. prove that Anglo-Saxon fingers are more at home. Some cabinets by this firm, and by Wright & Mansfield, are very pleasing, and the colors are for the most part in good taste—rich, but subdued.

The British tea-pot, made classic by Pope and Johnson, leads us into the realm of clay. Since 1690, when a modest factory of delft-ware reared its chimney at Burslem, the island potters have given quartz, kaolin and red clay no rest. Twenty-five years ago the industry already employed seventy thousand operatives. Wedgwood was its Watts, and some of his reproductions of antique vases have not since been surpassed. That was before the days of art-schools. Their introduction has improved form more than material, and the finer porcelains do not rank among the specialties of England. Her exhibitors at the Centennial cover, nevertheless, a wide range in ceramics, and their display far exceeds in extent that of any other country. Not only do they build, furnish and decorate the house from the portico to the mantel and the teaboard, but they drain the lawn with underground pipes and dot its surface with vases and statues. They assume even to expel from the parlor wall the delineator on canvas of landscape and history. Thus we have the love-passages of Touchstone and Slender consigned to the safe-keeping of an earthen tile that may be broken, but can neither fade nor decay.

A long façade of these jewels of the Black Country lines on the western side the northern half of the transept. For representatives of high art in fictile ware we may select Daniell & Son. Their vases present some good antique forms. These are elbowed by examples borrowed from a widely different school. Some of Landseer's dogs come out of the furnace in good condition. Not so with the groups after Teniers which decorate a service loaned by the earl of Derby. We have seen many a cheap wood-cut that did more justice to the Raphael of the ale-house than do these princely platters. From stalls like that of the Daniells the gradation is continuous through the richly-colored tiles of Minton, the less vivid encaustics and majolica of Maw & Co., the terra-cotta of Matthews, the Watcombe Company and Doulton, and the vitrified bricks of Hamblet, to the Lambeth-ware jugs of Stiff & Sons and the ventilation- and drain-pipes of Jennings. In the clay-built temple of Doulton & Co. the possibilities of crockery are illustrated to their full extent. Colossal statuary, milk-pots and paving-tiles join in building up the structure. The firm has given its name to a special and popular fabric.

Then we step from Staffordshire into the Land o' Cakes, and bring up again at Aberdeen against stoneware of another kind — more solid and more polished, and baked in the central furnace of the globe. Nor is the many-colored granite sent by the Highlands to our halls and cemeteries by any means the only art-product for which the Centennial is indebted to that unpromising latitude. A capacious show-case filled with Gaelic jewelry, arms and decorations is striking for the great variety of the designs and

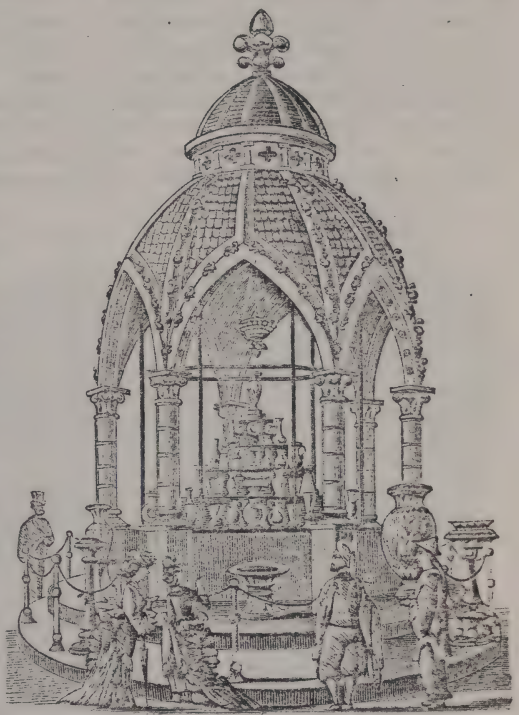
the unique and effective character of many of them. Their prevalent style is neither Greek nor Gothic, yet they show delicate fancy and correct taste; and we are at a loss to name any other collection of like extent in the building more instructive as to what the eye and hand are capable of fashioning out of familiar materials than that of Aitchison of Edinburgh.

Silks may be classed among the fine arts if only for a background, a warm brocade being a famous stand-by with artists for that office. The London silks are of good strong colors, with a tendency in the figured fabrics to a tile-like or geometrical mode of ornamentation. The Irish appear to our unpracticed eye better. With such colors at hand as those of Romney and many others, English stuffs ought to be unsurpassed in dye.

Sheffield hardly does itself justice, some of the German displays of hardware holding their own well against English competition. The surgical instruments of Mayer & Meltzer (German names), and the artistry in firearms of Greener, Lancaster, Eley, etc., better sustain that side of the hardware department.

"Beauty made the bride of use," as Mr. Whittier hath it, continues to be the be-all, if not the end-all, of British art. The engraving of a gun-barrel, a dog-call or an umbrella is a labor of love with its votaries and their most profitable customers. The same can no longer be said of bookbinding, to judge by the specimens in the exposition. English students, perhaps, have ceased to pause at the outside, and now make their library friends most welcome in a working dress. The literary corner of the section has, however, much to interest. The shelves and tables of *The Graphic* lay bare the anatomy of that journal, with its co-ordinate systems of pen and pencil, minutely and distinctly. Among the artists it employs are several leading names, and the original sketches exhibited are far from being their poorest work.

In the British empire are included all the latitudes and nearly all the races.



TERRA-COTTA TEMPLE, EXHIBITED BY DOULTON & CO., ENGLAND.

Its display is a world's show in itself. The appendage, colony or province, the long-delayed recognition of whose magnitude and value in the queen's title was lately so grudgingly accorded by the people of the mother-country, possesses a population three times greater than that of any Christian nation represented at the Centennial. India might have illustrated from her records, architectural and literary, the origin of Western civilization and polity, but she was too remote to have her industry, art and traditions satisfactorily outlined on our soil. For whatever reason, her section is more meagrely furnished than that of colonies infinitely less important and worth studying. There are some old arms, cash-

mere shawls, embroidered stuffs, models of boats, fruits, seeds, large photographs of buildings and landscapes, and carved-wood furniture. The gold and wood-carving from Bombay is curious, and some of it good, but a poor sample of the best Hindu handiwork. The furniture indicates a dying-out of the old conceptions and a rapid substitution of European ideas. In intricacy and profusion of design it is poverty personified in face of the lacework in stone on the friezes and columns of the ancient temples executed before and since the Mohammedan invasion. The atrophy thus implied cannot possibly have seized a country so vast, so peaceful, so progressive and so rich.

Another British colony, markedly the opposite of India in age, population, ethnic character, climate and individuality, is amply and handsomely represented. Strictly colonial in character, and overshadowed by Great Britain and the United States, Canada could scarcely be expected to do much more than reflect their modes of life, thought and activity. Her exhibits, however, are not without novelty. Her school-system is placed before us

CARVED FURNITURE, FROM BOMBAY.

broadly and intelligibly. It is obviously one of her favorite public cares, and we cease to be surprised at the handsome show made by her publishers and booksellers. In manufactures Canadian effort seems to confine itself to the supply of special local wants growing out of the climate and other conditions. Stoves, furs, woolen fabrics, saws and cotton yarn lead the list. The art of keeping warm is cultivated with more assiduity than any other. Hence a gay display of blankets, rugs, nubias and wrappings new to southern eyes. From the far-off settlement of Victoria come "blankets made by the Indians from the wool of the Rocky Mountain goat"—an industry, we imagine, likely to remain an Indian monopoly.

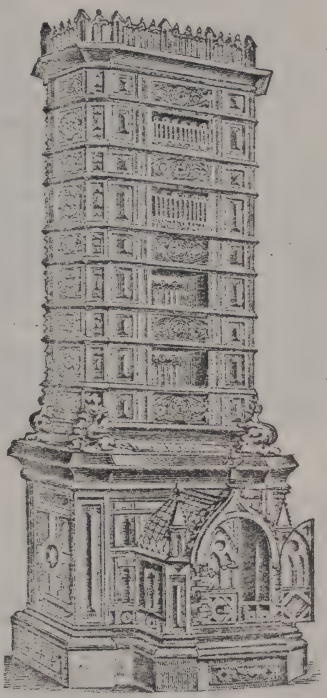
Tropical Jamaica is a neighbor to boreal Canada. She sends rum and sugar—four times as many brands of the former as of the latter, a great deal of sack to her bread. Coffee is a more respectable tipple, just reviving in commercial prominence from the effects of emancipation. Many very pretty woods, a variety of drugs, spices, jams and candies,

combine to redeem the island from the one distinction of Old Jamaica.

Taking the Antilles for stepping-stones, we pass by Bermuda with its coral and split woods, the Bahamas with their salt and sponges, and Trinidad with its basket-work, gums and hemp, to the South American main. British Guiana, introduced to the scientific world by Waterton, has not advanced much since his day. It is still rich in bay rum, sugar and coffee, but does not apparently care to make a particularly impassioned appeal to Philadelphia.

Over the way Afric's sunny fountains roll down some samples of gold-dust. Besides this, Guinea furnishes better things, notably palm oil. But she has nothing to keep us long from crossing the Equator to the Cape. That singular jumble of Dutchmen, Englishmen, Hottentots, Kafirs and Bushmen, living together and apart in every form of independence, union and subjection, introduces us to many aspects of its kaleidoscopic life. Constantia wine, worthy an emperor's table, ebony, tobacco, diamonds, charts of docks, wool, are mingled with ostrich eggs, lions' skins, immense tusks of ivory, karosses and other bits of barbarism pure and simple. The Orange Free State, an odd sort of quasi-republic inhabited by seventy-five thousand whites and some blacks, asserts its sovereignty away off in the south-western corner of the building, far from England and her colonies proper. For a country of its size this exhibit is astonishing, and none the less striking for the style in which it is presented. A small glass case in the centre of a pavilion hung round with hides and horns of antelope, rhinoceros, etc., books of butterflies and jars of dried fruit, contains diamonds from the famous gold-fields of South Africa, the heritage and germ of the microscopic republic. Coal, an endowment that by some chance presents itself in all the footprints of British commerce, is not wanting on the Vaal. To judge from the specimens exhibited, however, we should say the South African seams were thin and of poor quality.

A general similarity of products marks the insular and peninsular settlements of England in the southern hemisphere. Extending through all the zones of that side, they possess in common certain agricultural and mineral staples. Their geological structure aids in accounting for this. Primary, metamorphic and volcanic rocks predominate. Rich mineral ores, unencumbered by thick strata of aqueous origin, a high and broken surface favorable to the growth of wool,

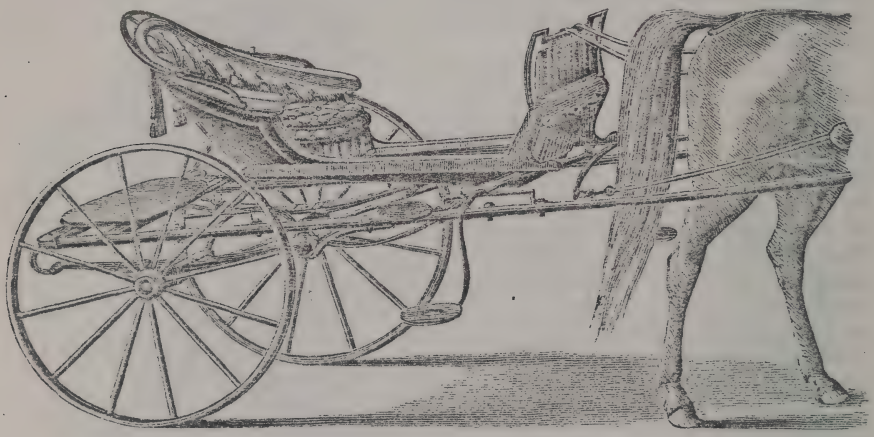


PORCELAIN STOVE, FROM SWEDEN.

and a deficient rainfall discouraging to the cereals, characterize the Cape, New Zealand and Australia. New Zealand's supply of moisture is more ample than that of the others, as her specimens from the forest and the farm show. She contributes a new fibre, phormium, in the raw state and in such manufactured forms as cordage, mats, etc. Wools and plain woolen fabrics are still more prominent on her shelves. Hops lend them an Anglo-Saxon air, and aid us to realize the antipodal Britain that is being built up in the twin islands. The government

machinery assiduously employed in its erection is illustrated by a series of carefully-prepared geological and topographical maps—charts to guide the immigrant to the homestead he needs and to reduce settlement to a science.

But it is to the young colony of Queensland that we must turn for the most elaborate and detailed array of these valuable appliances. No State of the American Union, any more than the Federal government, can show anything to compare with these pictures of the face of the country and its structure. The mineral framework beneath, the natural growth above of timber and grasses, the watercourses, coast-line and estuaries, quarries, surface-washings and lodes, sheep-walks and tillage, methods of transportation by land and water—a perfect portraiture, in short, of the country—we have spread before the eye. Nor can it be



SWEDISH CARIOLE.

said to be strictly a miniature portrait. The photographs are of extraordinary size, and, thanks to a pure dry atmosphere, remarkably distinct in detail. They are, moreover, improved—and not, as often happens, obscured—by color. The drawings of surveys are equally satisfactory. To the reproduction of the country they have developed are added haphazard likenesses of the inhabitants. These serve to show that, perhaps from the shorter period during which climatic influences and new modes of life have operated, the physique of the colonists has not departed so far from the European type as in our case. Though the temperature is not less extreme than ours, and the hygrometric contrast with the Old World greater than in the United States, the people have fewer angles and more *embonpoint*. As the fathers of a coming Pacific empire, and the commercial neighbors and rivals of our own States on the shores of the same ocean, their faces and that of their land have a special interest for us. The spirit and thoroughness shown in their pictorial bids for immigration warn us that they are destined to be no mean competitors in the commercial race. Nor is this impression weakened by a glance at the shining pyramid that represents the gold extracted in the last eight years, the ingots of tin and copper, the samples of a more valuable export, wool, and of sugar, coal, dried fruits, etc., sent by the great island-continent.

The British empire grows like a tree. We look farther and farther out to the ends of the widening branches for flower and fruit. The trunk from which they draw their being must be sound and hale, as it clearly is, but the atmosphere into which they are pushed, and which gives them much of their sustenance, must also be pure and healthy. We study

and admire in them the effect at once of new and old conditions.

From young, teeming and genial Australasia a step or two, dryshod under glass, lands us in iron-bound Scandinavia. Above us springs, from a stranded galley, an iron mast, with iron rigging twisted and knotted as intricately as hemp. Battle-axes and cross-bows and lances, old and genuine, depend from rocks, and a mail-clad Berserker presses forward to the prow, eager to ravage a fresh coast. With him the savage side of the picture comes to an end. His teeth are drawn, and Norway is seated at the work-bench of the nations, as patient and tame as any of them. To indoor work she has mainly to confine herself. With less than two per cent. of her lands arable, the best products even of her farmers must be won at the fireside. Hence, the numerous and often delicate bits of wood-carving exhibited, done by peasants in the long winter nights and stern winter days—watch-chains, charms, cabinets, etc. We have, too, the newspapers and books that beguile the same hours—*Illustreret Tidende*, with its cuts descriptive and jocular, side-splitting to the Norsk apprehension, but blank and flavorless to the foreigner; the school-desks and copy-books used in compulsory public education; and the stoves, tall and solemn and many-storied in cast iron, or elegant in bronze and porcelain, that keep the nation warm. That the people have, too, a particularly vigorous out-door life is made sufficiently manifest by the large display of government publications. Charts and elaborate shaded maps lay before us the highways of different grades, the plants, animals, mines, manufactories, geology and navigation of the kingdom. One of these tinted charts is deserving of especial study by our shipowners. It shows the movement of the Norwegian marine, now so rapidly encroaching upon our own vessels in our own ports. The fisheries alone of Norway employ twenty-seven thousand men, sturdy Lutherans who feed the Latin Catholics during Lent with cod, thriftily reserving the livers for phthisical English and Americans, who will be interested in the trophies of oil-bottles that abet and abut the stoves, the rich furs, the sleighs and carioles, and the curiously-twisted iron bars.

HUNTING-GROUP, FROM SWEDEN.

The section occupied by the sister-kingdom is more varied in its attractions. Swedish iron, long unequaled for toughness, is illustrated in every shape, from lumps of ore to wire and mathematical drawings of the furnaces and geological maps of the mines. These engineering productions are not the only evidences of the importance attached by the Swedes, in common with most other European nations, to art-training. The crayon drawings by pupils of the public schools of Stockholm, Örebro, Malmö and Nordköping are of the highest merit, and

decidedly the best of their class in the building. Nothing equal to them can be found in the American school-exhibits scattered over the grounds. In ceramics, Rörstrand excels Staffordshire in design and in the fineness and compactness of material. In color the Stockholm majolica may perhaps rank lower. Some inlaid porphyry and marble is noticeable in this connection as giving further evidence of artistic feeling. An obelisk of friction-matches is a fit transition from the domain of taste to that of fireworks more or less destructive, peaceful and military. The traditions of Gustavus and Charles are not forgotten under the Bernadotte dynasty, and we are treated to a warlike panorama of guns, harness and wax soldiers that might better have been sent to Cronstadt than to Philadelphia. The strength of the modern Goth lies not in sword and shield: we see it in the schoolhouse, the forge and the factory. Mightier than Sweden's little army is the fact that ninety-seven per cent. of her children between eight and fifteen attend school. This guarantee of the intellectual corresponds to the evidences of the physical health and strength of Young Sweden afforded by the costumed figures of the peasantry, notably those in the family group collected round the dying moose.

Thorwaldsen's influence has doubtless overflowed into Sweden from Denmark, in whose terra-cotta with Etruscan designs we trace his inspiration. In purity of form and freshness of coloring it is worthy of his school. Some ebony furniture by Hansen of Copenhagen is in similar taste. If works of this kind represent, as we think they do, Denmark's forte in the exposition, the traditional weakness of "your Dane" may be traced, by one critically inclined, in sundry racks of Kirschwasser.

Reminiscences of Holstein may have induced the distance between the Danish section and that of the German empire. If so, we shall for the nonce bring them into their natural propinquity and spring southward across the isthmus of Lubec. Always possessing a bold, the new power now offers a beautiful, front. The bronzes, faïence and chased silver that blaze out from between her tall black and gold columns upon Britain, France and the United States are as formidable to her rivals as the other columns and reserves she erstwhile set in motion. Her art-products have yet somewhat of the ponderous and unplastic in their style, exact and well studied as they mostly are. The weight of such massy subjects as Bismarck and Wilhelm, who pervade the whole German department, solid and decorative, helps to account for it. Saxony and Bavaria are not enough to leaven the lump. Dresden, indeed, does not put forth her full strength. We should place, however, in the highest rank the porcelain of Wappen, Giessele, Koch and Bein. The grounds are not so rich as some others, but in tone and mellowness the colors are all that could be wished. The observer will come upon many isolated bits of faïence of striking merit among the different stands. Bronzes abound, but as a rule they lack sharpness and precision. The details which give character and raise a casting into a work of art are lost.

Meyer's ivory carving is curious and good. The make-up of this display, with its tusks of elephant and narwhal, is unique. The wood-carving of furniture exhibitors is generally faithful, and lacking only in lightness and elegance. No defect in this direction can be ascribed to the wall-paper of Herling, in imitation of silk and Spanish leather—a novelty our upholsterers should study and adopt. Wooden toys, dolls and trifles of that sort fill several gay cases, with manifest advantage to the general effect of Germany's display. This specialty Central Europe will long monopolize. Our farmers will not soon make an industry of whittling or their wives of doll-dressing. Quite as vivid are the exhibits of the colormen. German dyes and pigments are remarkable for brilliance and cheapness, and will continue to stand high in the market so long as German chemistry maintains its present position. The Nuremberg ultramarine would have been a divine vision to the old masters, who paid for lapis-lazuli

more than its weight of gold, and who, unable to purchase it themselves, were often fain to be watched by their monkish patrons to see that they faithfully accounted for all of the precious pigment that was entrusted to them. Another delight to them would have been Faber's treasury of black lead and chalks. The chromos would have caused them surprise, though not of a wholly agreeable character. Our surprise is that the display of these lithographs in color is not better. The art seems to have come to a standstill for a time. Lithographers might be tempted to allege that it had caught up with the pictures it reproduces, but we think unjustly, the tendency of modern oil-painters to thinness and monochrome being by no means universal. Chromos, like photographs, form links between art and literature, and they are less satisfactory in the German section of the Main Building than some specimens of the other form of copy, the autotypes especially of Römmler & Jonas of Dresden. These are certainly admirable—clear in outline without losing atmosphere and effect. Better ideas, not only of pictures but of sculpture, can be conveyed in this way than by the commercial bronzes which overload the counters. The bronze reduction, for example, of that magnificent work, the monumental group in honor of Frederick the Great, can give but a general idea of the original, its niceties being slurred in the casting. A good photograph, or series of photographs, would preserve all of these and give us the exact truth.

Critics who claim familiarity with the actual attainments of North German art in silver, plate, glass, bronze and porcelain allege that its display here argues a cynical contempt for American taste, and that its treasures were all kept at home. If so, it was a grievous fault, and grievously will the kaiser's mercantile subjects answer it, for the average judgment of our purchasers in such matters is good. Our people know how to select if not yet to execute; and this fact will be discovered by England and France at the expense of any dubious competitor. Germany's immense publishing trade,

RUG OF VARIOUS FURS, FROM SWEDEN.

too, might have had more to say for itself. There is some solid work in bookbinding, and the photographs of topographical maps in relief are things we ought to imitate. Prussia's specialty in the province of material for bijouterie, amber, appears almost exclusively in the rough. The interest of this collection would have been enhanced by a series of the insects, eight or nine hundred species, found imbedded in the fossil resin.

In the less prominently-situated section of Austro-Hungary we strike a palpably different artistic vein. This relic of the Holy Roman Empire lies nearer Italy, and breathes a whiff of southern air borne over the Alps. We find that Austria possesses, with something worth seeing, the art of welcoming those who desire to see it. A graceful fountain, with a border of plants and encircling seats for the weary, attracts one within her confines. Bohemian glass is first inquired for. It sustains its reputation. Among the exhibitors of it may be named Lobmey of Vienna and the factory of Count Harrach. This charming industry has wandered into the Tyrol, Innsbrück showing remarkably rich glass of an olive-green tint. A very curious

product is the "glass-wool" of Schreiber & Neff, a brilliant but, we should imagine, unhealthy textile. Wagner's glass is marked not only by the delicacy of its coloring, but by the boldness of the engraving and the strong relief into which the designs are thrown. Leil, Böhn & Lux present repoussé work in silver and plate which would attract more attention in a place less teeming with that branch of the fanciful. Ecclesiastical work—reliquaries, shrines, crucifixes, etc. — abounds, but manifests its usual tendency to degenerate into tinsel. The smoker's bijouterie in meerschaum and amber is not so far beyond the like exhibit in the United States section as it would have been a decade since. Thanks partly to the cigar-excise and partly to the largely-increased immigration of Germans, the pipe has risen into an American "institution," with a corresponding development of its manufacture and decoration. It has its museums, its schools and its literature, and concedes to its worshipers by the Danube no advantage but that of being nearer the mines of sea-foam.

Furniture made of bent wood, in infinite luxuriance of curve, twist and trellis, bronzed, gilt and carved, is quite peculiar to the Austrian section. Kohn's pavilion, constructed of this material, is a study. The exhibit of Thonet Brothers is rich in color and upholstering. This style has great capabilities, and they should be cultivated by our manufacturers. In musical instruments much was expected from Austria, and the display of them is ample and varied enough to satisfy the most ardent connoisseur in noise. The Indian, meditating over a cask of whisky, estimated its contents at fifty fights; and in the mouths of these trumpets, gaping for the battles of the future, one may read the record of many an embryo charge and rally, and long lists of killed and wounded. The empire enters also the lists of the spinners of cotton, wool and silk, and shows that in substantials, as well as elegancies, 1873 was not lost on her.

Especial mention is due to the photo-microscopic pictures of Haack. They show trichinæ and other parasites, enlarged with a distinctness that leaves nothing to be wished. They are wholly free from the granular coarseness that destroys the value of ordinary "thrown-up" photographs.

The idea of making near neighbors of the most widely-separated nations would appear to have governed many of the allotments in the Main Building. Austria is next door to the United States, and a tour to Bohemia through England, Scandinavia and Prussia leads us directly home. A pause upon our own soil will prepare us for another excursion. We are reconciled to repose by a look at Tiffany's silver, placed in the forefront of the American battle and flashing defiance on France, England and Prussia. Glitter, at the same time, is hardly a word for the contents of this representative booth. They are rather quiet in style and appearance, correct, rich and tasteful as are the designs. The variety of surface, color and texture given to silver is a feature more observable than in the collections opposite. A fine example, as regards both design and workmanship, is the Century Vase, which is conspicuous among the exhibits of the Gorham Company.

Though several other exhibitors show fine work in the precious metals—among them Morgan & Headly, Caldwell & Co., and Haas & Co. of Philadelphia — their displays are far exceeded in bulk by those of the britannia and plated-ware trade, which has become quite a prominent industry in the United States. Adams & Co. of Providence, Rogers Bros. of West Meriden, and the Middletown Plate Company have shelves filled with evidence that art has been mustered into this service. The forms are well studied, and for the combination of elegance and adaptation to use these stalls are not excelled by anything in those of Europe. Good art-schools, as yet, to say the least, a novelty in this country, must effect still greater improvement. If this sham silver is to become the standard American metal for household use and ornament, it is well that artists should make it as presentable as possible. Not much more

valuable than clay, it is almost as plastic and susceptible of finer modeling.

Another art-manufacture, more recently introduced, is that of celluloid, an imitation of coral. Being cheaper, more manageable and quite as pretty, it bids fair soon to supersede the marine product. Still more of a handicraft is the carving in tortoise-shell, beautifully illustrated by Hildreth & Co. of Northboro', Mass., and Adams & Co. and Spaulding of Providence. This is all legitimate work of hand and eye, done with chisel and saw, and much of it in the highest degree

CENTURY VASE, EXHIBITED BY THE GORHAM COMPANY.

commendable. We may perhaps class with these minor ornamental efforts the wax flowers, fruit, etc. from Miss Bloodgood's works. They are by far the best wax imitations in the building.

Of our ceramics there is not much to be said. Galloway, Graff & Co. of Philadelphia have some well-executed casts from the antique. Porcelain is not an art-product with us, and in its simpler forms it has made less progress in this country within the past half century than most other manufactures. The same may be said of glass; and here lies one of the fields of improvement in which most may be expected from the exposition. The Etruscan Company of Trenton seems determined to strike out for itself a new path.

Cornelius's lamp designs maintain their old reputation. They are better than the average of the German makers in beauty and lightness. The few American bronzes exhibited in the field of art proper indicate want of study.

Many displays of marble mantels, étagères, etc. prove the riches of our quarries and the promise of our carvers of stone. Fauchère & Co. of New York exhibit some exquisite work of this kind.

One of their mantels is wrought in an agate-like alabaster, called in the trade onyx-marble. It is pearly and semi-transparent, and takes the chisel well. A baptismal font in Vermont statuary marble is the chief attraction of an excellent exhibit by Struthers & Sons of Philadelphia. The polished granite of several exhibitors ought to render us independent of the Scotch cutters. St. Johnsbury, Vermont, supplies a gray stone not inferior to that of Aberdeen.

In furniture of wood the display is worthy of that prominent and progressive industry. It is difficult to select names, but the work of Cooper & Brothers, Philadelphia, is both novel and elegant in style, and the carving well done. Schasty & Co. show some rococo sets in reproduction of the fashion of the Revolution. Bent wood, we think, might have come out in greater force. We must not forget to name a buffet in walnut, marble and bronze by Karcher of Philadelphia.

Wood-carpet is a curious invention. It, like wall-hangings of veneer, is still, we believe, on trial. Inlaying by machinery promises to add largely to the decorative uses of our long list of fine timber trees.

The show-cases and pavilions of the American section argue a fund of native taste and fancy that awaits little more than education to enable it to bloom into true art. Here, for example, are two stands which would earn admiration in the French or Italian quarter. One of them is filled with paints and artists' materials. The other enshrines an assortment of tacks. Oils, chemicals, fruit-extracts and a number of other staples smoothe their ordinarily unattractive front with similar grace. Mechanical toys have brightness enough to be independent of so elaborate a setting. They are a new product in the United States. For many years the hope of competing with France and Germany in toys was abandoned. The cheaper and more common kinds are still left to those countries, but a class in which mechanism acts, and which can be made in quantities by machinery, has been successfully appropriated by our producers.

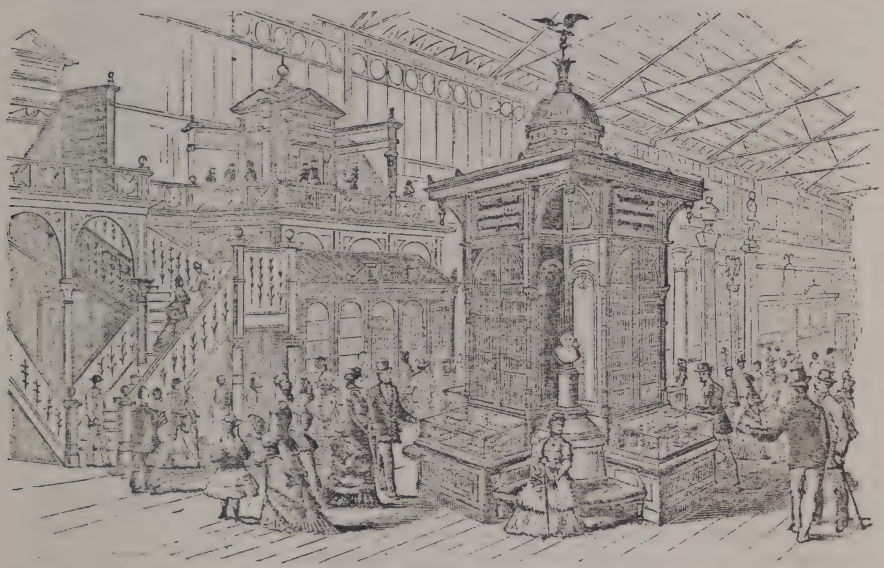
The domestic supply of carpets, a much more important industry, as the census shows, is on an old and sound footing. The exhibit is ample and good, including the coarsest and richest fabrics. As they are conspicuous individually, and have a quarter to themselves where they can be readily compared, we need hardly print the notes we have made on their comparative merit. The colors are often rich and in good keeping, but in other cases both tint and design clamor loudly for art-schools. The same may be said of oil-cloth. We may name among the carpet-manufacturers most prominent for merit in ornamentation Smith & Sons of New York. Others join in giving earnest of a determination not to let their designs fall behind the education of the popular eye. The condition and tendency of public taste is, in fact, as truly reflected by the carpets as by any other decorative product. The large single pieces do not compete with those sent from France, Holland and England, one reason being found in the inadequacy of the home demand for them.

Paper-hangings play a prominent part in the finish of American interiors. They are not so fully represented as might have been desirable. A sunny and riant character prevails among those on exhibition. Gilt, white, the grays and positive colors are more at odds with the requisites of harmony and depth of tone than the more sober schemes of color which mark European specimens. Imitations of different woods, and the attachment of wood itself to a backing of paper, are becoming popular, and will tend to give the decoration of our walls more mellowness and repose.

Paper, the flimsy clothing of so much more of our art and all our literature, presents itself in every form, from the crude and purely utilitarian shape of roof-sheathing to the most delicate note paper—a sentiment itself in tint and texture—and *éditions de luxe* from the leading publishers of the United States. We turn from a dingy and ill-smelling sheet that would enable several cottages to defy the storm, and proclaims itself the largest ream ever made, to elaborate show-

cases, delightful alike to authors, readers and bookkeepers. The last will dwell with professional rapture on the wide array of account-books, dense of leather, manifold of tracery and tooling, and flexible as broadcloth. To judge from the massive journals, day-books, etc. of Short & Forman of Cleveland, the conclusion is natural that that city does not expect a commercial decline as sudden and rapid as its rise, but looks forward to centuries of thrift worthy of monumental records.

Books more generally instructive and less monotonous in the character of their contents, chronicles of other things than dollars and cents, rear themselves in brilliant profusion in a tall pavilion common to several publishers. This enables the cursory observer to compare at a glance the productions of the "Murrays, Lintots, Tonsons of the times." J. B. Lippincott & Co. of Philadelphia occupy a handsome pavilion of their own, distinguished not more by the variety and style of the long list of publications exhibited than, in the estimation at least of the visitor who likes to unite study and comfort, by the seats which surround it, and make it, like the Austrian and French sections with their fountains and



VIEW OF BOOK DEPARTMENT.

sofas, an oasis in the midst of a Sahara of plank floor.

Pens, pencils and school machinery, mathematical instruments, etc., make a show that excludes all apparent need of foreign assistance. It is not many years since our chief supplies of this description came from abroad. Now, metallic pens of every grade, pencils rapidly gaining on Faber, and better than two-thirds of those sold under that name, instruments as good, though not yet so cheap, as the German, and school apparatus, are made at home. A show-case of Kindergarten appliances is filled by a German firm of New York. It is complete and interesting — the models, flat and solid, cheap and generally excellent. From such collections our schools will select and reproduce.

In this neighborhood our eye is arrested by a singular outgrowth of strictly modern progress — a museum of the postage-stamps of all mankind. What a charm it would have had for Rowland Hill, who died less than a generation ago! To our grandfathers this mode of paying postage was unknown. Now, Fiji, Japan, Roumania, Egypt, the Deccan, the Sandwich Islands and some

scores of other new-found lands and newly-invented states have each their special set of devices for making private correspondence free of the mails

ZINC VASE AND FLOWERS, EXHIBITED BY THE CHICAGO ZINC COMPANY.

As specimens of local art, taste and culture, this collection would have more interest were the stamps all made at the place of issue. But they are mostly sup-

plied by engravers in Europe and the United States, and have accordingly a strong family likeness. Our engravers furnish the outlying nations with plates for this and similar purposes quite largely. The Japanese bonds executed by the American Bank Note Company prove that the mikado and his counselors have yielded to the temptations of credit, and are studying the art of making its path charming to the eye.

From gilt and floriated bonds and paper money to other products of attractive but delusive exterior is a natural transition. Sheet and cast iron coated by the galvanic process with zinc and copper fill

CASE OF SILKS, EXHIBITED BY CHENEY BROTHERS.

a large space in the United States section. A vase of flowers by the Chicago Zinc Company shows that the Graces are not unpropitious to Industry wooing them in this homespun garb. Shams for architectural pinnacles and cornices, more solid-looking lock, bell and drawer handles, and small bells and gongs of more genuine composition, lead up to legitimate brass and bronze castings, and point us on to a divergence from fine art and its pretence in the direction of honest iron and steel. The American axe, begotten of continental forests, has hewn its way across the world from English parks to Australian groves of blue gum, and stands confessedly at the head of all axes. Firearms, also, in certain classes an acknowledged specialty, are well represented. Iron in more rudimental forms—rolled, drawn and carbonized—appears in quantity, if not in variety and novelty of treatment, not unworthy a country second only to Great Britain in its product of this metal, and turning out yearly about as much Bessemer steel as the ancient mines of Sweden do of iron. For all that, we see nothing here to remind us of the intricately-twisted forms in which the Swedes, at the opposite corner of the building, present us their charcoal iron.

Not until we undertake to explore the wilderness of minor manufactures do we realize that our country has long since shed its colonial wrappings and has become an industrial world able of itself to fill a world's fair. The five acres allotted to its thirty-five hundred exhibitors under this roof are occupied without an over-

display of any one branch, and with many imperfectly illustrated. A walk through the section proves that some known industries hardly appear at all, and that nevertheless there are few things of any substantial consequence which we do not manufacture. A bare list would be a long one. The item of watches, in which we have lately sprung at one bound to an equality in constructive merit with the English, French and Swiss, will suffice to suggest the approaching supremacy of our artisans in fields they have as yet not more than entered upon. Pianos also they have quietly made their own. European manufacturers seem to have abandoned competition in them upon our own soil or in the general market, for they exhibit none to compare with the array on the American side.

More prominent and long-established manufactures are more content, apparently, with simply holding their own. An immense display of cotton and woolen fabrics could not fail to be made by the district extending from Delaware to Maine. The solidity of the sheetings and prints must strike foreigners, while we may in return study with advantage the compactness and dye of their woolen cloths. The handsomest thing among American woolens is the Minneapolis blanket. The Spaniards and Dutch approach it closely, but, we think, do not equal it in combined softness and density. Flannels, hosiery and other fabrics of that class are of merit commensurate with the exactions of our winter climate.

In silk-weaving we have to draw upon the future. A great deal of silk is shown, but it does not come up to Lyons, or even Dublin. The neutral solid colors of Cheney Brothers and the gayer silks in figures of the Passaic Works claim mention. There can be no good reason why the enormous annual tribute sent abroad for silks should not soon be canceled.

The display of the United States, as a whole, is not below what was looked for by our own people. In the finer departments of art-manufacture its position remains one rather of expectancy and experiment. But the material and the capacity seem to be there.

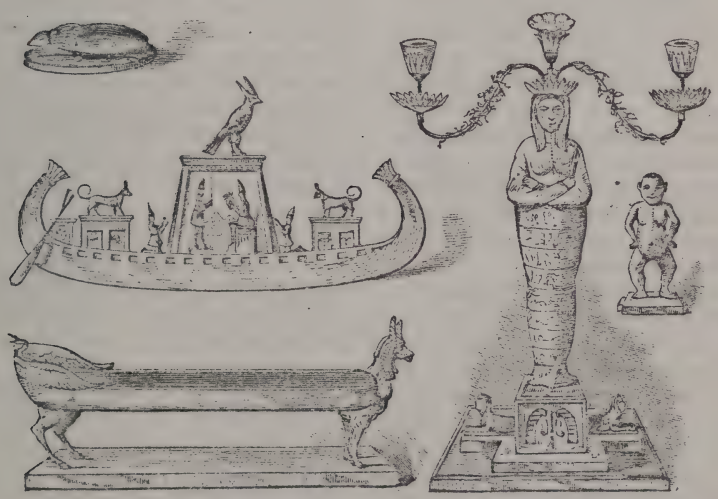
Though no longer a colony, the Union has not attained a metropolitan position, and can marshal no train of dependencies like those of England, France, Spain and the Netherlands. If absolutely required to appear at court with a retinue, Columbia would be as hard put to it as the mistress of Tillietudlem. She would probably press into service Liberia and the Sandwich Islands, the one with white and brown livery of coffee and arrow-root, and the other decked with the sugar-cane and feather fans.

Nay, we do Hawaii injustice. For so small a community, and that declining in population, its exhibit is most creditable. It includes ornamental woods of great beauty neatly inlaid, olona and several other textile fibres of value, sugar, rice, corals, sulphur, and, better than all, a file of school-books printed on the island. The books are well chosen and well printed. They do not include the whole list employed, many being imported from the United States. The children number twenty-seven per cent. of the population; and from the extent and success of the public-school system, the inspector-general of which, Mr. H. R. Hitchcock, is Hawaiian commissioner to the exposition, we should infer that this isolated society of Polynesians was quite up to the average culture of one of our backwoods settlements.

In this article are thrown together the sections of some nations calculated to illustrate each other by resemblance or by contrast—the like in like as well as the like in difference. The building we now traverse is, however, it will be remembered, only a part of the ground upon which at the Centennial they meet for comparison. In parceling them out for description we shall keep this in view, and endeavor to associate those which can best be measured between themselves by the classes of subjects to which the Main Building is appropriated.

PART VIII.

IN THE MAIN BUILDING.—CONTINUED.



SILVER WRITING-DESK FURNITURE, FROM EGYPT.

IT is not a particularly long trip, even by sea, from Honolulu to Manilla, and in the exposition it is very short. The Philippine Islands are housed with the rest of the Spanish dominions within the stately and somewhat sombre pavilion of imitation syenite that bears the two castles. The bark-cloth of the Sandwich Islands suggests the grass-cloth of the Philippines, but it does nothing more. In quality there is no comparison. The latter is among the most elegant fabrics in the building. Its delicacy, lightness and variety of tint place it high among the finest products of the loom. This is the forte of the Tagals, their other contributions being unimportant.

The mother-country, whom we thus

reach through the back door which she long essayed to keep, like other back doors, firmly barred against intruders, shows in her manufactures the effect of half a century of disorder and civil war. Her silks are coarse in texture and garish and Oriental in color. The same may be said of the shawls and rugs. Only the white blankets prove that the merino has not been thrown away on Spain. They cause one to crave a winter night in the Pyrenees for the luxury of a nap under them. Among the Barcelona cotton prints are some very pretty patterns, markedly superior to the feeble, spotty designs so common in that humble fabric. The porcelain exhibited is behind the age. Louis XIV.'s boasted flattening of the Pyrenees has not yet been effected, and Sèvres is still out of sight of Aragon. The majolica is not what the Balearic Isles, the cradle of that glazed pottery nine hundred years ago, might have been expected to send. Openwork hose, worthy the most faultless ankle of the Puerta del Sol, and shirt-bosoms of lace more than worthy its escort, introduce us to some picturesque traits of Spanish costume. Then we have the broad sash, mutton-pie cap, bell-buttons, gaiters and sandals of the rural exquisite. Spain is more of an agricultural than a manufacturing country, and stronger in the fine than in the commercial arts; as we shall see farther on.

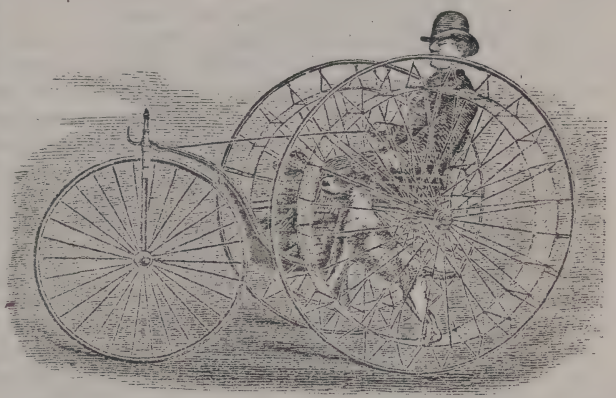
The industrial transition is abrupt from the land of Philip II.'s heirs to that of his whilom vassals of the Netherlands. When he and they parted company, they had for centuries been busy in bailing out their sunken soil, but all their achievements in that respect were as naught to what they have since accomplished, to say nothing of the capstone they will in a few years have set to their aquatic labors in the draining of the Zuyder Zee.

The Low Countries have one-sixth the territory and less than the population of the State of New York. Their system of hydraulic works much excels the Erie Canal in cost and magnitude. They support a sovereign government, an army and a fleet, and remain able to lend our projectors a hundred and fifty millions for the building of American railways. This little group of facts is in the air as we enter the neat portal of their not very showy section of the Main Building. We do not find ourselves among marvels, unless that name may be given to the carefully-executed maps and plans of public works. We see some grotesque tiles, some heavy *batteries de cuisine*, and a fire-engine that would be promptly ordered off by the police at an American fire. Better than these are the carpets from Delft in the Smyrna style, glass-work, perfumery, fleecy woolens, waterproof paints, chemicals, hangings in imitation of marble and wood, and other minor manufactures. Heavy bicycles tell of smooth roads and a level country. Matters there are clearly on a practical and well-ordered basis. We come to understand how, with Java for a reserve, the North Sea and the southern statesman are kept at arm's length.

Passing into Belgium, we come at once upon marked traces of Latin influences. These have been exerted during four centuries of association, industrial, religious and political, with the southern races, until a French tone has pervaded not only the language, but the life of Belgium, at the expense of the old Flemish character in thought and art. This tends measurably to deprive the Belgian exhibits of the strongly-marked individuality they would have possessed had the exposition been dated back to the days of the burghers, and to give them a colonial complexion, or, more exactly, that of a French province.

The merit of the Belgian display is nevertheless in many divisions very considerable. We should pronounce it greatest in those branches of industry devoted to the decoration of interiors and in the illustration of educational methods. The extent to which paper-hangings have risen toward the level of a fine-art product is nowhere better exemplified than in this section. We must accept them as the modern representatives of the old arras, widely different as they are from that tapestry in style and substance. Instead of being wrought into religious or historical pictures, they are confined

to the imitation of simple, isolated and repeated objects, and of special materials, such as marble and wood. These designs and the stock arabesques are brought out with much truth and study, guided by an artistic feeling not often perceptible in the loftier efforts of Belgian artists. The national genius seems to forge the beautiful best with a strong alloy of the useful. So it was formerly, when even Rubens allowed excess of naturalism to render grotesque his treatment of emotional themes, and when his contemporaries at the opposite extreme of the artistic scale illuminated the firesides of England and of other northern countries with tiles enforcing equally elevated conceptions in a style still more bizarre. Of these tiles we have specimens, but they have lost value except to the antiquarian and the fancier of rococo. As regards ceramics, Flanders may safely be said to have advanced.



CARRIAGE PROPELLED BY DOGS, FROM FRANCE.

The data here afforded do not enable us to say whether improvement is likewise perceptible in wood-carving, once so marked a specialty with the Flemish artisans. A chimney-piece and set of furniture, *en suite*, by Van Ginderdusen of Brussels would command notice anywhere and in competition with almost any age. We might point to other good efforts in the same walk. What art-schools are doing for the promotion of this and similar industries in Belgium is shown less fully than the progress of ordinary education, which we are assisted in estimating by an ample collection of textbooks and school-fixtures, maps and records, and reports of literary and scientific associations.

Lace continues to shine among the staple manufactures of the country, and "right Mechlin" has by no means lost its good name. Such is the judgment of the fair explorers of the Belgian section. If a male opinion be admissible on the subject, we should place this elegant fabric among those things which always look better on canvas than in reality. Vandyke's lace, for instance, is richer, more airy and every way more beautiful than the original from which he painted.

Flanders and war suggest each other. But the armories of Europe's battle-ground show little here in proof that they retain their ancient cunning. The swords, damascened gun-barrels and finished firearms exhibited are no way remarkable. Extreme simplicity in mechanism and finish is a chief aim with modern gun-makers. Those of the Continent are apt to err in excess of ornamentation, which impedes handling and increases the liability to injury. In the heavier products of the foundry and the forge we find little enough of this. They give us a new idea of the mineral wealth of Upper Belgium and the activity shown in its development. The seaports of the kingdom are as near as London to the coalfields of the Tyne; so that the home-supply of mineral fuel, second in magnitude only to that of France and Germany, is yet but half the resource of Belgian engineers and manufacturers.

Industrially and artistically, as in a military sense, Belgium is a gateway to France. The Meuse is a pathway, and

not a boundary. As the French artists of to-day have taken up the *genre* pencil wielded so powerfully of old by the Flemings, French artisans have in like manner occupied the fields of decoration and fancy once the property of their northern neighbors, and cultivated them more broadly and in most cases more thoroughly. We go to Paris and Lyons for what our Elizabethan forefathers sought in Ghent and Louvain; and between Sèvres and Delft how vast the interval! Pius IX., had he a Raphael, would send his cartoons to the Gobelins, although it is more than doubtful if they would there be rendered with the richness and solidity of tint still notable in the work sent from the looms of the Low Countries to Leo X. For the Gobelin pictures fade. Mainly from that cause, and partially also from the low chromatic key adopted, they have, at least as here shown, a flatness strongly in contrast with the warm and robust coloring of some of the old Flemish tapestries.

Less fortunate than the historic ass, the stroller through the Main Building is arrested under the great central dome by four bundles of hay. "How happy could I be with either!" he naturally sighs as his eye wanders from Tiffany to united Germany, and thence on to Elkington. But the climax of his perplexity is not reached until he completes the circuit and confronts the blaze of MM. Perrot, Houry and Cornu, the upholders of the tri-color in bronze, marble, faïence and silver. We shall not say that his doubts come to an end in the moment that brings them to their height; but all Frenchmen, one-fourth of the Englishmen, a third of the Americans, and a mentionable fraction even from Fatherland, would so declare. And France would triumph under the crucial test of the second vote of each and all. The Berlin porcelain, the New York chasing, the London cloisonné, South Kensington metals and table plate, fill a trio of provinces under each flag which the others scarcely contest. But the excellence of the modestly-framed French pavilion shines in all of these departments. Fertility of fancy and knowledge and precision in execution, and the instinct of taste that is the soul to that mind and body, are manifest throughout in objects large and small, stately and bizarre. In Cornu's clock with a rotating pendulum, that particularly commonplace and artistically unmanageable contrivance is translated into beauty and elegance by a female figure which meditatively directs its movements with a wand.

Nor can the French be said to have closely and carefully massed their forces, Napoleon-like, on one pivotal position. Their foremost stall is one of many. A wealth of fancy overflows in many others distributed through the section. Decorative art, starting with bijouterie pure and simple, does not lose strength as it passes into the more substantial departments. Ostheimer, Sergent and others show many styles of faïence, and the lighter forms of the potter's art sustain the conceded supremacy of the French furnaces. It admits of question whether modern effort in pottery is not misled and wasted by too slavish an acceptance of mediæval and renaissance and seventeenth-century styles and methods. Palissy's merit, for example, consists far less in his mechanical inventions of body and glaze, picturesque and touching as the story may be of the painful perseverance through which he attained them, than in the conscientious precision and truth of detail he threw into his designs. Flowers, birds and animals he modeled from reality with the minuteness of an Audubon. It is here that the artists of our day should labor to imitate him. They possess better material, better pigments, better glazes and better ovens than he perhaps ever hoped for. In these points they are in advance of him, and to copy him is to retrograde. If to this advantage they add an equality, not to say superiority, in the command of form, they will have shown a juster appreciation of his teachings. The quantity of deliberately misshapen and discolored pottery in the exhibition, attractive only by the antique title given to it, and pleasing only to those whose taste is based wholly on the conventional and on names, is astonishing. Fish, fruits and

animals of barbarous type sprawl on great platters, slabs and vases of a dingy drab or yellowish-green color. Other tints are dragged in a washy way over these raised figures, and a coarse glaze adds glare to the whole. The old workmen, whose productions these assume to revive, were in the habit of doing their best, and never threw their time away, with malice prepense, on work beneath their powers. The shapers of the original red clay of Faenza congratulated themselves on the discovery of a colored and opaque flux with which they were enabled to give their ware a hard, smooth and permanent surface. The condition of chemistry did not allow them to go further in that direction; but the world of form lay before them, and thither they turned their eyes and hands. Another step was made long after when white clay was substituted for red. Then came calcined flints and kaolin, or silicate of alumina. The Limoges beds of the latter substance were discovered in 1765, a period which marks the second impulse given to the Sèvres works established nearly at the same time with those of Dresden, at the commencement of the eighteenth century. The capabilities of the wholly modern material, white porcelain, remain to be fully brought out. New qualities and textures of it continue to be introduced. What is called statuary porcelain was new in 1851. Figures in it are now common. Bisque and Parian objects are among the most common in this class at the exposition. Porcelain thus assumes to draw into its service the sister arts of the sculptor and the painter. Perhaps it has succeeded better with the former than the latter; for shrinkage and distortion in baking have been nearly overcome, while the range attained in color is much more limited. The best success of the French producers is in flowers and landscapes in half tints. Strong warm shadows for broader subjects they find it more difficult to compass, although they have some fine blues and purples. They continue their experiments, however, as we see in the *Vierge au Voile* and in a larger picture after Tintoretto. Whatever the general merit of these two efforts, they certainly surpass the tapestry copy of the wolf-hunt by Duplan.

"TAURO FARNESE"—BRONZE GROUP, FROM ITALY.

Art-work at once faithful and durable presents itself in Henry II. enamel. Of this elegant production, still justly a favorite with the French, we find several well-filled cases, among which we may mention that of Pottier. Many of the pieces have the ciphers, separate or conjoint, of Henry and Diana of Poitiers—names for once honorably united in the introduction of one of the special glories

of the French cinque-cento. Enameled ware in jewelry and larger objects is prominent in this section. Philippe's collection of antique jewelry is small but fine. That in the associated pavilion of Paris is more various both in style and merit. But the glitter of Boucheron's diamonds and rubies outshines these in the popular eye. Most of us may be "twirled" like larks by the dazzle of a ray of light from a crystal, whether gem or glass, red, white or green, differing from the birds only in demanding to be told that the charming object is a gem and not glass. In regard to broader sources of reflection even that difference disappears, mirrors attracting both alike. But the self-indulgence of fluttering before the immense and faultless sheets of plate glass that prove the maintenance of French superiority in that manufacture may be pardoned to all bipeds, winged or wingless.

Inlaying furnishes a transition from the purely decorative to its combinations with the useful. The shellwork of Cléry stands forward in its class. A chimney-piece inlaid with porcelain by Parfoury & Lemaire is a more conspicuous product in this department. A marble mantel by the same makers is in a style more familiar in this country.

Glass in the more valuable form of telescopes and similar instruments is shown by Bardou & Son and other exhibitors. The display is not actually either large or striking, but is so comparatively with that of other nations more noted now than the French for success in this branch. It is not to be criticised save by astronomers and opticians, and by them after careful inspection and experiment. Other observers can only glance and pass.

It does not need experts to appreciate the breadth and excellence of the literary exhibit of France. The large alcove occupied by the contributions of the municipal government of Paris in maps, reports, architectural illustrations, etc. would of itself establish the attainments of the nation in this field. Goupil's collection of engravings and chromos illustrates modern taste and method in such reproductions, and the older and better school of line engraving may be studied on other shelves. The Cercle de la Librairie is a joint exposition of late French publications. The separate displays of Rothschild and Morel embrace some magnificent albums of engineering, topographical, botanical and other scientific plates, though the bindings are far outshone by the unique and costly specimens exhibited by Lortic. The pen of the French writer is a more delicate and flexible affair than ours, and we cease, in contemplating it as here offered in gold, silver and steel, to wonder at the superior airiness of its touch. It is clear that French comedies can only be written with a French pen, and the Anglo-Saxon playwright must learn to wield that instrument before he can claim a higher name than "adapter."

The presence in the literary corner of well-mounted skeletons of the adult gorilla and orang must be accounted for by the merits of those anthropoids as illustrators and not originators of science. They are far more instructive than the most careful engravings of the living animal, and natural history demands for its study more and more the aid of such preparations.

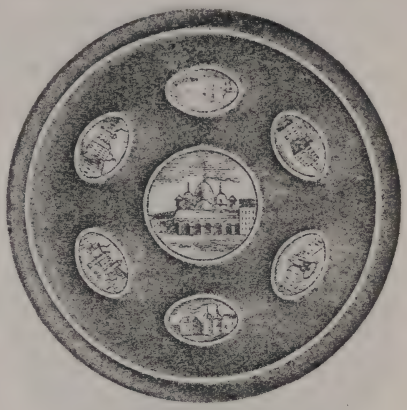
That branch of ecclesiastical art which more particularly belongs to what we may not irreverently style the "stage-business" of worship figures largely in the French section. It has less of the Gothic character than among the English and North Germans. The chests, chairs, brasses, fonts, chalices, etc. are naturally of a more Latin type. The effect furnished by crucifixes the Lutheran zone denies itself. We find them among the French, as with the Austrians and Italians, in great profusion. Mayaud Frères exhibit them in ivory of various sizes, but so uniform in model and in a certain frigid scholastic accuracy as to be less interesting in mass than any one specimen viewed separately would prove.

France does not cumber her department in the Main Building with the more massive adjuncts of her cult, such as stained-glass windows, but we can study an effect corresponding to that which they produce in the gorgeous curtain-

silks of Tassinari & Chatel and Henry. What there is of dim religious light in those tissues is charged with the richest color, which catches, transmits and blends itself with it, without absorbing it, as would be the case with the less gorgeous but more opaque material, velvet. Outside the church, velvet, the antipodes of a trout-stream in being always deep but never dark, is as much in favor with the artist as the brook with his cousin the angler. What would Vandyke, Velasquez, and, last and least, Tom Lawrence, have done without it? We doubt if either of them ever reveled in a lovelier "spread" of this fascinating fabric than Faye & Thevenin of Lyons offer to the gaze of the thousands. We cannot pretend to criticise the velvets and silks of this firm, or those of Tabard, Bresson, Gautier, Gondard and other exhibitors in the same class, whose united treasures turn the French section into something finer than a Field of Cloth of Gold. Lyons silks enjoy a supremacy which places them above criticism, all their critics necessarily coming under Disraeli's definition. Where experts have failed we may be pardoned for dropping the judicial pen, content only to admire. We stand only less blankly before the beautiful black lace of Calvados and the similar display of the Compagnie des Indes, and Cohn's studies of form for the ladies, which prove how charming a woman may be without even the pretence of a head.

Artificial flowers are numbered among those "things of Paris" that are as a matter of course perfect. Habituated to this belief, we were disappointed in the show of them. They have a faithful look, but lack the brilliant and startling verisimilitude that takes one's eye by storm. An artificial flower, unless it be if anything a little gayer and more graceful than the original, or capable at least of producing that impression, is a self-declared cheat.

Since the day when Watteau decorated their panels, French equipages have claimed an oblique recognition among the fine arts, if only below the salt. The gilt carriages of the Monarchy and the Empire rank among the shows of Versailles. Famous carvers lavished their talents on the nave, the spokes, the canopy and the pole. That day has passed, perhaps, for several Septennates to come, and coach-decoration has declined. It furnishes, however, some sufficiently elegant carriages to the exposition. Having come too late, or been too late in choosing their



ROMAN MOSAIC TABLE-TOP.

place of rest in the proper annex, they alone of all their class come into the Main Building. They are not so light and workmanlike as the American vehicle, but they are eloquent of good roads to a country sadly derelict in that regard. Giving them all credit as preachers of road-reform, their place might have been more entertainingly filled by a fossil diligence with its rope-harness and a Languedoc grape-wagon.

In the department of cutlery we find some unaccustomed forms. French steel bears a good reputation, but English and American manufacturers insist that its make-up is inferior. However that may be in some articles, the exhibit of surgical instruments, so many of which have been invented by the Parisian surgeons of the past half century, is calculated to attract the profession. A heavier class of ironwork, strong boxes and safes, gives our makers of such articles some lessons in elegance of shape and finish, if not in efficiency to the main end. A fireproof safe may be artistic as well as boots and shoes, which among the Gauls are proverbially so, as several pavilions

sacred to the male and female chaussure amply attest.

The co-operative plan of exhibition, so marked a feature in the French section, is carried out in the display of cloths and cassimeres by the manufacturers of Elbœuf, and in woolens generally by those of Rheims. Producers who set the fash-

FLORENTINE MOSAIC TABLE-TOP.

ion in male as well as female wearing apparel are likely to know how to maintain the supremacy they have reached, and it is for American manufacturers to review their array and study its weak and strong points. All observers who do so, whether experts or not, will conclude that the idea that French excellence is confined to the ornamental and superficial is a great mistake, and that the substantial and the tasteful are by no means oil and water.

Like lessons, on a more limited scale, are taught us by Switzerland, who adjoins her great neighbor centennially as geographically. In entering her section we shall be struck with the immense maps which drape it. Nothing can be finer in its way, and for the scale more satisfactory, than the large topographical map of the republic. The Alpine engineers must, one would say, have set up their theodolites on every chamois-perch and eyrie, and smoothed the way thither for every eye if not every foot. Not only are barren cliffs that can never produce a blade of grass thus microscopically depicted, but the railways and other paths of commerce and the people are as minutely and perspicuously mapped. The Swiss citizen, seated at his fireside, can hover over the summit of Mont Blanc and look down upon his country complete to the humblest hamlet and the most secluded rill.

Cosmopolitan Geneva gives no signs of surrender to the competition of American labor-saving contrivances in watch-making. She spreads out her "kit" of tools for that business side by side with the finished product. Machinery she is gradually adopting, and bids fair to hold her own tolerably well until steam shall develop æsthetic power and neutralize her present superiority in taste. Doubtless some Yankee will ere long pin crotchets and quavers to iron cylinders by means of drills and hammers worked from a piano keyboard, and revolutionize the musical-box trade. Till then the admirers of revolving music will turn, with a longing not otherwise to be appeased, to the counters strewn with the imprisoned music of Geneva in caskets elaborate enough to reconcile the most sensitive of scientific composers and connoisseurs. From these trinkets the observer slides very naturally to the gold pens, carved wood, inlaid furniture picked out with niello, ethereal muslins, the laces of Appenzel and St. Gall, and less airy embroidery wrought by the dwellers among glaciers and granite. It is odd that the rugged mountaineers should put forth their strength in light and fanciful industries of this character, to the exclusion of the more substantial. But the Alps are not rich in minerals. Coal and iron, the sombre pedestals of England's manufacturing greatness, are wanting there, and the handicrafts, strictly so called, must remain Switzerland's chief support. One product of her mines, latterly growing in importance, is exhibited. This is the Seyssel mastic, a bituminous limestone used in all the European cities for pavements, and replaced in this country—very inadequately, as Centennial pedestrians will agree—by coal-tar diversely compounded. The United States are not without quarries of this fossil mixture of lime and organic matter, but

we have never seen any so strongly bituminous.

We are left no room for doubt as to the deep concern felt by the government and people of Switzerland in education. It would seem, from the display before us, an impossibility for the native faculties, in whatever grade or class of endowment, of the poorest Swiss child to starve for want of stimulus and culture. Even the idiotic brain is assailed from all sides by a variety of intellectual probes, and if a spot is found penetrable by light, a concentration of rays is sure to be directed upon it.

Following the beaten track of centuries, we descend upon the Po. Italy appears for the first time as a unit at an international exhibition. In 1873 her consolidation was incomplete. Palermo, Rome, Genoa and Venice join with equal voice and spirit in proclaiming the industrial and intellectual vitality of the young kingdom and the old race. They are assisted by Florence and Naples, the former always so remarkable for her proud individuality as to be classed by some thinkers among the most obstinate and effective obstructors of the solidarity of the Peninsula.

Italy is artistic or nothing. When we enter her territory in the Main Building or elsewhere we look for "the fatal gift of beauty." If fatal, it has proved an extremely slow poison: she thrives upon it amazingly. She takes up a bit of wood, and straightway the fatal endowment breaks out over its whole surface and penetrates the entire substance. Next comes to her hand a bit of marble, and the rugged surface disappears in favor of tints and veinings that had lurked unknown: all the lines of grace steal over it, and it becomes the embodiment of sentiment and poetry. A bit of dull lava is cut out from the bed where it had cooled ages ago: chance bits of vari-colored alabaster, serpentine and malachite are laid upon it, and a flower, an animal, a human face or a scene springs into being, fresh, true and changeless in hue and outline. The triumph of the machine-shop and the cotton-mill are not hers. Should she ever attain them, as the unique achievement of the Mont Cenis tunnel suggests she may, they too will be wreathed with the garlands of art, and we shall be treated to decorative walking-beams, floriated fly-wheels, and calico-patterns worth hanging in a gilt frame.

The complaint is of too great facility in executing beautiful designs. Practice and genius have made the faculty mechanical, and insipidity and sameness

VENETIAN MOSAIC TABLE-TOP.

are the results. To some extent this is the fact, but the error is in the right direction, and a people which has been beautifying the world for centuries may be pardoned for dozing over its chisel and its pencil.

Here is a group of wood-carving by Valentino of Venice. One massive piece represents a broken ruin overrun by the ivy and the lizard. All is cut out of the wood, and all, whether representing utter dilapidation or perfect and active life, is true to motive and tells the story without a stammer. Yonder are a chair and priedieu, figures of angels clustered over them, not thrilling in the *tout ensemble*, but graceful and pleasing throughout. Other objects of the kind are in bronze and wood, the transitions of contour and of material harmonious, and not violent or abrupt. But many other nations show wood-carving sometimes competing effectively with Italy. In Florentine mosaic she has no competitors, and she seduces you into a wilderness of it, all

so good and peculiar that it is difficult to decide which of the artificers to name. We may, however, specify the collection of P. Bazzanti & Son as large and excellent. The exhibit of A. Civita may also be mentioned. Francolini's portrait of Lincoln is a capital likeness, made with apparently accidental and amorphous bits of gray marble. What is usually known as Roman mosaic is abundantly represented, but does not show to advantage by the side of the Florentine style. It lacks atmosphere and light, and what effects it is capable of are reached at too great cost in labor and money. The purchaser usually finds himself the possessor of a curiosity rather than a picture—a thing interesting only for difficulty of execution. This may be said of the pope's large table of the ruins of Pæstum in Memorial Hall. All of us have seen better chromos of the same subject. By the side of its results the immense cost of this kind of work becomes absurd. A detestable little copy in mosaic of Guido's Beatrice is ticketed at one hundred and fifty dollars. A circular table-top is far better in execution. A reduction of the Farnese Bull in bronze by Ciapparelli brings us into a more satisfactory art-province.

Among the inlaid work are seen some imitations of the Japanese, which only serve to repoint the moral that he who follows must go behind. Italy is strongest on her own ground. Some fine cabinets are shown of inlaid ebony, lighter woods and mosaic. The prices of these and other like articles are not calculated to democratize art. A beautiful little casket in carved wood is ticketed at one thousand dollars. To some similarly-priced ecclesiastical furniture the financial objection is not the only one; the display being marred by a quantity of trashy glasswork that might elicit raptures in the Abruzzi, but nowhere else. Costliness cannot be objected to some painted majolica well and tastefully made. But it again confronts us when we turn to the Genoa filigree and the Venetian chains and other goldsmith's work. The city of Columbus has on this point caught the Centennial afflatus more intensely than the city of the Doges. The latter falls behind her repute in both orfévrerie and glass, and rests her case more conspicuously on large and clear photographs of her architectural and scenic charms—pictures Mr. Ruskin might have lent with strict injunctions for their return. Leghorn contributes of *her* gold, minted from the *aurea seges*, but it is eclipsed by Florence in the strawwork of the brothers Lantini. The weaving of this fairy woof implies the extreme of tenuity in fibre and in fingers.

Brass is well managed in metallic bedsteads, little more expensive and by far more sightly than the iron structures shown in other sections. Circumstances have directed attention to the recommendations of metal couches less powerfully in this country than in Europe. While our people will not soon take to sleeping on brass, they will like to be awakened by the brazen clangor of the bells. A beautiful casting by Lestini has been purchased by the Italian church of St. Mary Magdalen in Philadelphia. Whatever the tone of this bell, its decorations make it a work of art, though they do not place it on a level with some statuettes in similar metal, notably reductions of the Vatican Augustus and Michel Angelo's David, and electros by Pellas after Donatello and Benvenuto Cellini. Good copies of statues *in petto* are so rare as to make part of this collection specially worth naming.

As a rule, the Italian mind is supersaturated with the classic, in the midst whereof it lives, moves and hath its being. Cupids in wood run around mirror frames, and cupids in terra-cotta hoist tin umbrellas over fountains to protect Psyche from the rain. They are unexceptionably-modeled Cupids too, anachronistic as their occupations are. In wood, bronze, marble and clay, with or without wings, they are the same ancient babies. In that field, in fact, for several reasons, originality is difficult, and we may expect the same little dimpled figure to be reproduced by generations of future artists. Few things are more beautiful, and none more convenient for modeling.

Of ordinary commercial staples, Italy

contributes surprisingly little. Her woven goods in wool and cotton are coarse and meagre. Everything of the solid kind is thrown into the shade by the art-side of her display.

Making the nave our Levant, we cross eastward to Egypt. For the ample display over which hovers the winged globe we are less indebted to Rameses, Omar, Mehemet Ali or the khedive than to Brugsch Bey. The Egypt of the exposition is his creation, brought into being and offered to American eyes by his untiring and discriminating effort. One wishes the United States could be so compactly and completely condensed for study as the narrow strip of river-bottom that constitutes the classic and scriptural realm of the Pharaohs and the Ptolemies. Beginning with hieroglyphics, mummies and photographed temples, we are led down to the industries and life of the one thrifty province of modern Islam. If the illustrations run back chronologically, they are likewise projected ethnologically into the wild regions of Equatorial Africa. Ethiopia sends the rude relics of her lost civilization, dim in spears, mats and tom-toms. Moving north from the domain of Theodore and his duskier neighbors, the darkness lightens. The Fellaheen, poor dwellers in mud huts as they are, surpass the blacks. They grow cotton, sugar, silk and dhourra. They also fabricate a few simple articles out of shells, such as spoons, combs, etc., which the worthy commissioner insists are better and cheaper than those of Christendom. This superiority, we confess, did not strike us. On the contrary, manual adroitness is argued, by what we saw of these small manufactures, to be deficient in the Arab. He invents nothing: no new process suggests itself to a mind blunted by a dreary and unfailing alternation between dry land and flood, and he pumps away at the *schadouf* as his ancestors did for ages before Abraham. The conditions which chain him to the rôle of an agricultural automaton prevent him also from falling lower. His present rulers appear disposed to do what they can for his elevation. Common and technical schools have been established, and the radical step of female education tentatively taken. The drawings and chirography of native pupils attest and justify the efforts which have been made to develop the minds of the masses. The writing, in different characters, of inmates of the institution for the blind at Cairo is very curious, and becomes more interesting when we recall the prevalence of ophthalmia in the Valley of the Nile.

JAPANESE VASE.

If the literary market of Lower Egypt demands such fastidious typography as that upon the shelves of the publisher Mourés, enlightenment among at least

one class is a fixed fact. Nothing can be sharper and neater than both font and impression in the Coptic, Hieratic, Greek, Arabic and other Oriental characters. This promise for the future of literature is shown side by side with the records of its past in ancient papyri or transcriptions from them. Other antiquities are represented by a model of the Great Pyramid and photographs of the temples. The camera introduces us also to the modern race and their works. The "heads of the people" prove them to be lean, shrewd if not alert, and unmistakably Caucasian if we exclude the importations from the interior. The aspect of their cottages is not seductive. The simple products of their handicraft exhibited are ruder than we should have expected from what has been said of the progress in late years of the cities of the Delta. The silk fabrics are heavy with barbaric gold, as are the embroideries. Some of the latter are rich and effective, and cloaks thus decorated are remarkably moderate in price for the labor bestowed upon them. The cumbrous saddles are little more than masses of crude ornament. Furniture inlaid in arabesque with ivory and mother-of-pearl, silver objects in good imitation of old Egyptian, and a small display of porcelain close the list of noticeable manufactures, and we turn to the more profusely and luxuriantly filled cases of raw products—cocoons, textiles, gums, grains, fruits, wool, ornamental woods, etc. These are eloquent of the fatness of the land. The Egyptian bill of vegetable fare is certainly ample, and has not been materially changed for centuries. The beans, onions and cucumbers that built the Pyramids and moved the obelisks from the quarries furnish caloric, fibrine and phosphate to the human machines that operate to-day in the shadow of those mighty structures. It is not easy to suggest anything needed to the completeness of the Egyptian exhibit. It seems to be exhaustive of its subject.

Tunis, whether for want of the Nile or of the khedive and his great-grandfather, is behind Egypt in industrial progress. Her arms and woven fabrics are very rude, and the lion of her collection is the Carthaginian mosaic representing that animal larger than life: hardly a tessera is lacking out of the thousands which form the group. It is obviously not a production which ranked in the first class when made. The execution is hasty and perfunctory. The correctness of the drawing shows through this imperfection of finish, making the work thus more valuable as an indication of the condition of art at the time than it would have been had the same design been more thoroughly executed.

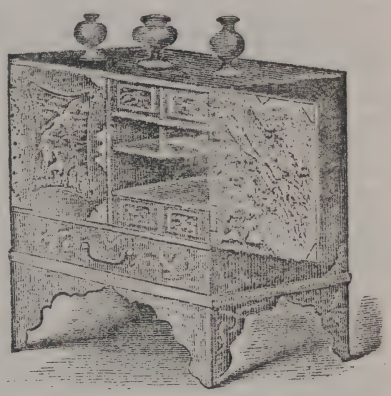
Mongolia is appropriately placed in the north-east of our glass world. The impression of novelty produced by the exhibits of its two empires, China and Japan, is strong in the minds of all observers, however complete they may have deemed their acquaintance with the attainments of those peoples in the arts. Something masterly in technical execution was expected, but none were prepared for the luxuriance of fancy, the knowledge of natural forms, the endless fertility in combination and the enthusiastic pursuit of finish here united with metallurgic skill and command over all the difficulties inherent in the various materials employed. Never before, it is safe to say, did Cathay and Zipangu make a movement so concentrated and sweeping on the appreciation of Europeans.

We have been accustomed to relegate Japanese art to the domain of the hopelessly grotesque. The best we have generally been able to say for it was that the caricature was intentional, and the only puzzle was why it should be indiscriminately applied to all and every subject. Such prepossessions disappear as we stand before the fountain that occupies the vestibule of the Japanese section, inlaid with silver, covered with raised figures, and more crowded with embellishment than a Gothic shrine. Beyond this is literally a forest of bronze, with interlacing stems, leafage and feathered, scaled and furry inhabitants. Penetrate it, and you find that like other forests it separates into individual members, vases of various hue and shape representing the trees. The most striking of them,

like many of its fellows, has left its native soil for ever. It goes to an English purchaser, as others do to American amateurs and museums and schools of art. Think of such a concession from the conceit of Western civilization! It is content, at the first summons, to accept instruction in one of the highest walks of industrial art from what it has been wont to style the effete and mouldy civilizations of the extreme East.

One merit of the Japanese work is prominent at first glance. The metal, whether dark as walnut or light as silver, has just the right surface and texture. It is polished, but not dazzling. It does not distract the eye and distort form with glitter, like our red bronzes. Nor is this desideratum obtained by such devices as turning parts of the metal into an ore or salt like verdigris or oxidized silver. The hue is uniform, and, though usually dark, admits light enough for the due expression of the most intricate forms. All of them reach the eye, and as a consequence the designer could not venture to slur any part. He is always clear and positive, though never quite unconventional. The dragon is a favorite animal, as it has until very lately been in European poetry, art, heraldry, tradition and *history*. They show you part of such a creature at Warwick Castle, the victim of Sir Guy, and the skeleton of that immortalized by Schiller was long preserved, if it is not now, by the heirs of the Knights of Rhodes. The elephant also figures frequently, with digitigrade joints, as we often see him still depicted in our schoolbooks and in German works at the exposition. The lion is as recognizable as the Athenian lions at Venice, and the tiger is intensely tigerish, his leading character of ferocity swallowing up a good many of his other traits, moral and structural. In the treatment of native animals and plants the amount of convention is less, but it seems to depend more on caprice than on knowledge, and may be considered as a concession to professional traditions, like the parted hair in portraits of the Nazarene, the aureole of saints, the skies of gold-leaf of the pre-Raphaelites, and the wiry grass, pasteboard leaves and sheet-iron drapery of their modern resuscitators under Mr. Millais.

Represent what they may, the objects on the Japanese vases are no lay-figures. Strenuous movement is apparent everywhere. They are all going somewhere or doing something, and that each in its characteristic way. Like the artist who



JAPANESE CABINET.

creates them, they never seem to hesitate. He never encourages or discourages his critic by palpably boggling over a difficult passage or confiding to him any of his troubles. Method and precision follow his touch everywhere, and we have the comfort of perceiving that he knows his own mind and invites us to make no allowance—a relief which would reconcile us to far more primitive and faulty productions. Nor does the artist ever confess himself weary of his task by repeating his figures as though turned out of the same mould. Each is accorded its separate and just share of attention, and thought out by and for itself.

These characteristics pervade all the work before us, from colossal vases to drinking-goblets. Specimens of the latter are in a combination of bronze, silver and gold, the last in filigree. The art has apparently flourished for centuries without much change in style and merit. Among the objects exhibited are reproductions of the Japanese antique, but they do not conspicuously excel modern originals. In the most recent works

traces may be detected of European influence. An approach to our taste in model, united with their actual supremacy in execution, would place the Japanese artists in metal on a still higher level than that they now occupy. The draughtsmen of their country are learning perspective, as their exhibits prove in contrasting modern drawings with those of the old school. This branch of art is meagrely represented. We were most struck with some illustrations of pathology, the performance perhaps of one who linked his future more with the healing than the pictorial art. Carving in wood partakes of the style and merits of the bronzework. The effect is in some cases heightened by staining the wood. The lacquer furniture, in all its varieties, has become familiar. In needlework the Japanese women make a most creditable show, worthy for delicacy of any section in the building.

The Japanese silks are disappointing. They lack lustre in both tint and fibre, and the looms on which they are woven are of course far behind the jacquard in power of ringing changes on the tissue. Upholstery is correspondingly defective.

Passing over such articles as marble, granite, iron, tin, copper, timber, seeds, etc., all appearing in ample force to guarantee the empire a sound commercial position, we seek the evidences of the new era in the educational and literary department. Printing and schools having existed in Japan from a period when the former certainly, and practically the latter, were unknown in Europe, samples of school-books of the old fashion abound. In adopting the new fashion in type, bookbinding and teaching, Japan has been as prompt as in other innovations. Her children are already able to show us their exercises in writing, composition and drawing. They look as natural as though Commodore Perry had been coeval with Da Gama, and the young idea had been shooting on the present plan for twenty times a quarter of a century.

More conservative China has few achievements of the reform party to show. What she offers is chiefly her own. She is rich in bronzes, similar in type but inferior in execution to those we have just noticed. The fantastic is carried further, and exaggeration in line and character becomes the rule rather than the exception. In woodcarving the balance must be cast the other way. Nothing can exceed the filigree in wood, as it may aptly be termed, which overruns the Chinese doorways, cabinets, chairs and caskets. It is hard to understand how it can have been done unless with chisels of watch-spring and fingers with treble the usual allowance of joints. Had the fibres of the wood been untwisted, and then woven like gold or silver wire, the result could scarce have been more lace-like. Inlaying is as deftly done, as shown in some beautiful suites of half-European form and in good taste from Canton. An arm-chair may be cited as a sample of Chinese progress in blending comfort and luxury. To learn what the knife and chisel can do with the hardest woods one must turn his back on the other sections and study China's efforts in ebony and lignum-vitæ.

We cannot suppose that the offerings of porcelain do justice to the condition of the manufacture in its native country. If so, the decline is marked, and the potters of Christendom are prepared to instruct their instructors. In fact, they are doing that already, the porcelain table-sets shown as Chinese having a clear infusion of European patterns. They have the advantage of being more cheaply produced than ours—a feature which attaches also to the genuine Chinese product. Large vases covered with ornament, much of which must have been done by hand, are marked at singularly low prices.

A number of bronze articles, more or less battered and fragmentary, are labeled as antedating the Christian era, and these are said to possess, from some peculiarities in the metal or the model, especial charms to the native virtuoso. To outsiders, judging superficially, this is not easy to understand. The ornamentation, where not worn or broken off altogether, is faint and poor, and the pre-

cious objects would not be picked by an outside barbarian out of a junk-shop. The more recent bronzes are better every way—a pleasant thing to be able to say of anything in a country we are taught to consider as effete and retrograde.

If in their bronzes and in some of the colors of their porcelain the Chinese fall behind the subjects of the mikado, the case is different with the more important staple of silk goods. These have more lustre and elegance. Nor have the Japanese anything to match the wood, and still more the ivory, carvings that swarm in bewildering variety and intricacy under the dragon flag. Fancy productions of this kind have long been a specialty of China, and there seems to be no de-

VIEW OF THE CHINESE DEPARTMENT.

cline in their merit and abundance. The Oriental finger has not lost its cunning.

Perhaps no one object in the collection brings together so well the strong points of the Celestial artisan as a bedstead with curved canopy, carved and inlaid, the upholstery of silk. This is both characteristic and good in all its parts. Another bedstead in a different style, near by, may be more pleasing to our taste, but it is not so illustrative and harmonious.

China's exhibit cannot be accepted as by any means a full or even a fair one as far as it goes. The contributions are chiefly from the coast, where the influence of commerce has wrought changes in the methods and industries of the people. The vast interior of the empire, stretching west to the Pamir plateau and north and south from Siberia to the tropics, remains unrepresented. A population dwelling in all the climates and outnumbering all Europe must have more to show, could it be got at, than can be seen or inferred in this little corner of a single building.

From China, in the exposition, a much shorter transit than that of the Pacific brings us to Chili. The national condor rears his leathery crest from an impromptu Andes three feet high, and gazes inquiringly on the red dragon over the way. The young republic, fadingly volcanic politically and geologically, contrasts well with the hoary empire too ponderous to be at war all over at the same moment, or to drop at once into the "ringing groove" of modern progress. Chili has had half a dozen wars, foreign and civil, in the fifty years of her existence, but has kept her eye uniformly on the other object, and bids fair to increase the rate at which she is nearing it. Her pavilion is admirably arranged—as are those of the South American states generally—and its contents are well selected

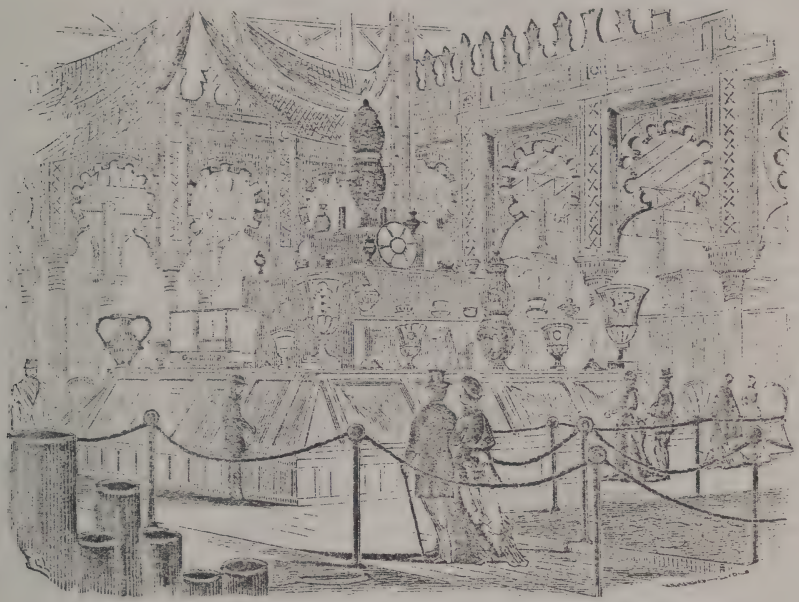
and good in their kind. In bookbinding and printing her display is in advance of that of the mother-country. We should say, indeed, that the air of the Andean slope on the western front was favorable to the art preservative. Peru shines in the same field. The two republics, with a population of some four millions, have built up a respectable literature, presentable in its external dress, and solidly useful in character. The Chilian mines of copper and quarries of marble head a long list of mineral resources well collated and presented on these shelves. Her strength in articles of subsistence is also made conspicuous. She has become an exporter of prepared fruit and other food-products. Samples of these are got up in remarkably neat and business-like shape.

CASE OF IVORY CARVINGS, ETC., FROM CHINA.

In the provisions contributed by Peru there is a greater preponderance of liquids. Wines and alcohol tell of vineyards hitherto almost unknown, but apparently cultivated with energy and intelligence. Sugar has a place in the yield of her irrigated fields, and cotton is grown to the extent of some twenty thousand bales yearly. These products of the limited strip of arable land along the coast are aided by alpaca wool, the one crop of the mountains save silver. Fertilizers, mineral and animal, take the lead in Peruvian exports. With guano, a not very fascinating possession, but exhibited here in all its pristine purity, everybody is acquainted. But guano will, it is feared, fail before many years—a consideration which lends interest to certain beds of nitrate of soda on the Pampas. That these will be a more lasting resource may be inferred from the estimate that deposits found over a space of fifty square leagues are capable of yielding more than sixty million tons. Whether to this immense fundum of fertilizers are to be added the mummies, of which, or of whom, samples to excess are placed on exhibition, we are not advised. Doubtless these hideous objects have in some way their value, but until we find it more distinctly stated we must be indulged in the belief that they had been better left in their long home, together with the rude vessels from which they ate and drank, and which go far to disenchant us as to the condition of civilization under the Incas.

Both these republics are stretching their hands eastward for the prize of transcontinental railway communication. Fired by the results of similar enterprises far to the north of them, they locate their California on the river Plate. The vigorous confederation into closer relationship with which the undertaking is de-

signed to bring them is not slow in doing its part, and while looking to the Pacific is far from forgetting the importance of keeping itself before the Atlantic public. The Argentine exhibit was prepared with great care, and, like that of Brazil, well considered and sifted under home inspection before being sent abroad. It is



VIEW OF THE INTERIOR OF A SECTION OF THE BRAZILIAN DEPARTMENT.

well worth examination. At the same time that it fails to materially change our impressions of the life of the La Plata valley, it certainly argues both commercial and intellectual energy in the two principal cities. There is a large exhibit of books published by the government and individuals. A sparse and semi-nomadic population in the interior has few wants, and is able itself to supply most of them. Its herds furnish the staples of food and clothing in beef and leather, and what its flocks can do for the rest is spoken in substantial and gayly-colored rugs and blankets, which improve at Buenos Ayres into gray cassimeres of excellent quality and appearance. The Indian loom, ruder than that of Guinea, is shown as a curiosity, and should henceforth only exist as such. The other manufactures are few and rudimental. The usual embroidered saddles, traveling kits and other appliances of life on the plains, appear by the side of some neat embroideries and lace, tables of inlaid wood and similar articles.

The republic's more richly and largely endowed ally, Brazil, has also shown a determination to satisfy would-be immigrants that the Sugar Loaf that sentinels the harbor of Rio was as safe a landmark in the cruise for a new home as any to be found in the marshy estuary of the La Plata. An elaborate pamphlet sets forth the same. Collections illustrative of the wealth of the empire were drawn from every province to Rio, and there, with the aid of public criticism, weeded of the unworthy or superfluous. The spirit thus manifested by the chief of the government and his ministers has, we think, achieved its chief present success in Agricultural Hall rather than in the elegant pavilion in the north-west quarter of the Main Building. Brazil is not a manufacturing country, and her staples, though the course of other nations would have justified their display

in the building we now survey, belong more appropriately to the agricultural department. There they have been placed, and will be noticed in due course.

Here we find little that is imperial. Brazilian craftsmen have confined themselves to such articles as soap, candles, shoes, hats, chairs, saddlery and hammocks. The gayly-fringed and plaited hammocks have a *far niente* air quite at war with the spirit of a growing and already powerful nation. Not so the maps, documents, photographs of interior scenery and similar attendants upon the opening of new lands and the extension of civilized industry. Files of newspapers, capacious and well established, and therefore well supported, are equally expressive. Art-manufactures take the novel form of featherwork and jewelry made of the wing-cases of beetles—odd and pretty things never likely to figure in the commercial list. Brazil's industrial position is that of a colony. This is perhaps due to the exacting nature of her task in reducing to the plough so vast an area of wild and fertile territory. The other South American states have less of that *embarras des richesses*, and consequently find both leisure and need for a more complex and advanced class of occupations.

The Spanish republic of Mexico has nearly the same population with the Portuguese empire of the south. Its political condition has been much more unsettled, but the inference from a comparison of the displays of the two countries would be strongly in its favor on the score of industrial progress. Mexico is still not strong in manufactures, but she exhibits silks and woolens of fair quality in dye and texture. The earthenware shown as the work of her Indian population is peculiar in style, strong, but not tawdry in color, and patiently finished as to its ornamentation. It is better than a great deal of the majolica and faïence of feudal times our collectors are buying up at fabulous prices, and our manufacturers are wasting their powers in imitating. In leather and its appliances, hats of every kind, and all good and cheap, and the usual female work in lace and embroidery, the Mexican stalls show well. The various yields of the agave family in fibres and fluids are amply set forth. The famous pulque is not enticing in aspect, and the rallying cry of the Mexican gamins, "Vivan nosotros y pulque!" becomes more incomprehensible than before. More legitimate wines from grapes and divers tropical fruits, cigars that argue the absolute absence of nerves in those who smoke them, coffee, plump of berry and bright of color, rubber, vegetable wax, vanilla, medicinal plants, textile fibres, with grains familiar or tropical, attest the power of the climate and soil. But these do not match the well-known mineral wealth of Mexico. While her silver-mines do not increase their product, they seem to be still profitable. As evidence of it a cake of four thousand pounds of silver from two hundred and seventy-two tons of ore is shown, with the statistics of the cost of reduction, amounting to less than one cent per ounce. More valuable weight for weight, this mass of silver does not approach in beauty the gem of the Mexican collection—the tecali marble, capable of the most perfect polish and indescribable in its translucent tints, melting like a fine sunset from the richest carmine into the most delicate pearls and lilacs, and deepening again, as the sunset does not, into the most intense greens. Then we have the sulphur from the crater of Popocatepetl, lead, copper, and silver ores in every combination and every grade of richness. A block of obsidian, of little use now, but indispensable for cutlery to the Aztecs, adds to the mineral display another sort of ornament. The literature, in type and map, of the Mexican mines and volcanoes is highly copious. Specimens enough to prove the fact are exhibited, together with many works by Mexican writers on education and science. In estimating the progress of Mexico, we must always take into view the isolation of its interior from the ocean, the difficulties of transportation, and above all the unpromising character of the human material out of which she had to erect an empire. She has made much more of the Indian than we have, and

can point to his actual condition with more satisfaction.

From the contemplation of this outlying boulder of the Latin formation lodged on the plateau of Anahuac, certain strange-looking inscriptions, as of the Athenian alphabet violently twisted in the attempt to combine with the Roman, summon us to a semi-Greek drift that has overspread the steppes of Scythia. The Gregorian calendar and a bastard alphabet adapted by Byzantine missionaries still tend to obstruct the literary and commercial identification of Russia with Central and Western Europe. Yet their effect in that regard is far from being marked in the profuse, varied and entirely creditable display in the section of the czar. The double-headed eagle is not fond of being addressed in a patronizing tone, but he is compelled to excuse the remark from strangers who pass under his wings in the Main Building that he surprises them. From both beaks, his eastern and western aspects, he speaks well. The original and the borrowed resources of the empire are alike presented in forms worth study.

BRONZE GROUP, FROM RUSSIA.

Among the art-efforts we should place first the bronzes of genre subjects, equestrian, hunting and domestic. They are nearly on a par among themselves in artistic merit, and show care and study in both drawing and finish. The themes selected could not be better rendered. We see the Cossacks and Tartars on their little ewe-necked mustang-like horses performing the feats of the Arabs and the Camanches, and bringing together in an imaginary amphitheatre the prairie, the desert and the steppe. The facility shown in bronze statuettes repeats itself in alt-reliefs in silver repoussé. A plateau by Sazikoff of Moscow is especially fine, and there is a large case filled with enamels of similar style. On a larger scale, and to that extent more taking to the eye, is the show of ormolu furniture; and more striking than all, if not artistically on so high a plane, is the grand array of vases, chimney-pieces and other decorative objects in the copper salt called malachite. In these the exceeding beauty of the material would outshine a more marked infusion of imaginative treatment than is perceptible in the finished article. In the most costly of the chimney-pieces, priced at six thousand dollars, the elegance of the malachite itself is rather marred by a parti-colored pattern of Ural marbles with which it is inlaid. Malachite is strictly a precious stone, and like other gems should stand by itself. As a material it has no other rival in the exhibition than the Mexican tecali.

The more ancient art of the country is represented by some very curious relics in Byzantine filigree and enamel. They interest from their resemblance to the early Christian art of the Catacombs. A lingering Oriental taste is traceable in the gold embroideries of modern workmanship, and we are brought back to Europe

by some passable majolica, terra-cotta and carvings of ecclesiastical subjects. Papier-mâché seems to supply a Russian industry. Some anatomical preparations in it are but second-rate. Swan's-down wrappings and the richest furs in the exposition are more pleasing to the eye, more locally illustrative, and every way more of a success. Stag-horn furniture, silks in very bold and noticeable display, excellent and workmanlike cutlery, hats, uniforms, fancy soaps, rubber goods in a large pavilion erected by the Russo-American Company of St. Petersburg, and grand pianos—about the only ones in competition with America—lead us among the factories. The empire is clearly bent upon supplying its own people in the old and new provinces with all the manufactures they can need. The prevalence of the national language and alphabet among the labels goes to indicate that it is succeeding in that purpose. Its advance into Central Asia is in the interest of civilization.

The Imperial Mining Institute contributes a complete collection of gold, copper, iron and other ores in proof of the mineral wealth of the country. This lies chiefly in the far interior, Western Russia being mainly diluvial in formation. The drawings of the Stroganoff Technical School, contributed by its two hundred pupils, illustrate creditably a public establishment of a different character, but looking to a similar purpose—the promotion and elevation of Russian industry. It is impossible, after glancing over the whole exhibit, from minerals to marqueterie, to doubt that this object is being effectively pursued, and that we shall have very decidedly to revise our previous impressions of the inchoate condition of Russian civilization.

Hard by the Russian section, Portugal beckons us from the far north-east to the extreme south-west of Europe. When we recall the position of this little kingdom, crowded into a corner of the Peninsula, surrounded on three sides by a single state, and that one not remarkable as an instigator to progress of any kind, and further isolated by language, our first impressions of her exhibit demand modification—a modification which will be strengthened by more thorough scrutiny of her very various display. Her manufactures of wool, worsted and cotton are mostly plain, and not first-rate in their classes. In silks she does decidedly better, and the show-case of Ramires e Ramires contains fine specimens for both surface and pattern. Heavy silks of the brocade style seem to hold their own in Portugal, and the admirers of this rich old material will enjoy a look through her shelves. Silk hats and cod-liver oil are conspicuous, as they are in nearly all the sections. These singular productions, could they be projected into the next Centennial, would be among the most startling antiquities of that occasion. The wearing of so unsightly and uncomfortable a headdress, and the swallowing of iodine in a vehicle so oppressive to the alimentary organs, must then be things of the distant past. Terra-cotta, another omnipresent article, has little to prove it a Portuguese specialty. The silver filigree, shown in many styles, is better. With this we may associate an application of wood which we do not observe in any other section—arabesque carvings in chestnut done by machinery, a graceful decoration that takes as many forms as rubber and papier-mâché, and has the merit of needing no paint and being what it pretends to be. In the last-named material the local costumes are represented on small figures more pleasingly than on the large effigies in the Swedish division.

In the map and pictorial department one is struck with the photographs of architectural interiors. The tomb of Inez de Castro, depicted in its infinity of Gothic ornamentation, distinct in dim religious gloom, suggests the romance of Peninsular history, and places us in the cradle of the ballad, far back of Chevy Chace.

On the banks of the Tagus we bring our tour to a close. We look back upon the vast structure we have traversed with a feeling of satisfaction that could only come from an exhibition marked by system, intelligent selection and completeness. Speaking generally, not only is

MALACHITE MANTEL AND ORNAMENTS, FROM RUSSIA.

the best handiwork of each nation there, but it is unincumbered by repetition, and arranged advantageously, whether for independent study or comparison. "Shop" is kept in the background, and if the governments do wield the yardstick, they wield it with diplomatic dignity and reticence. The political and scientific congress is grafted on the trade-meeting. Intellect and taste are not made to yield the *pas* to the machinery of money-making. Literature and art show their due prominence by the side of, with, and in manufactures: they are, indeed, in this, the especial and assigned palace of manufactures, comparable to them in the volume of their exhibits, and as interfused by means of the loom, the hammer and the chisel they may be said to permeate the whole.

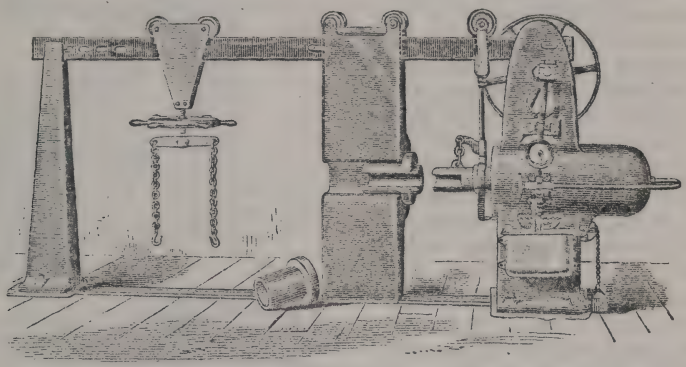
PART IX.

THE HOUSE OF THE IRON HAND.

GENERAL VIEW OF INTERIOR OF MACHINERY HALL, FROM GALLERY NEAR KRUPP'S GUNS.

WE are confronted on the left of the principal entrance to the grounds by a shapely structure covering four times the space of St. Peter's, and ticketed, like a satchel or a Saratoga trunk, "50." This label of Machinery Hall is hardly distinctive. It might be clapped on all lookers-on and on everything looked at, artificial or natural, since all are machinery, built up on system and working to fixed ends by fixed laws. The human machine, impelled by an internal motor that rests

not day or night, looks around at those of iron without recognizing brotherhood. Nay, it calls them its creatures and makes them its slaves. Its action has brought theirs into play—checks, stops, renews and accelerates it at pleasure. The machine conscious of this power and act of creation—and creation for a purpose—claims the possession of a will, and is by the latest philosophical advices credited



THE SELLERS HYDROSTATIC WHEEL-PRESS.

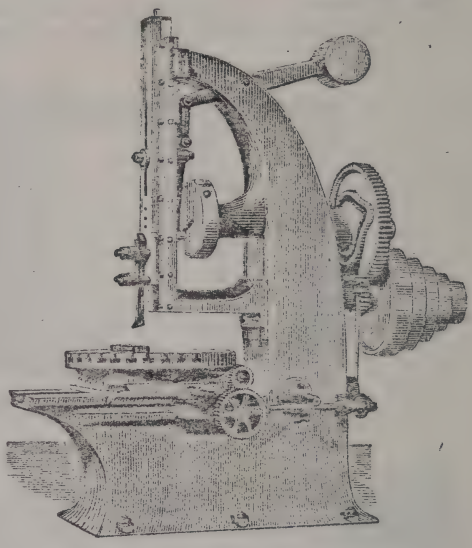
with the same. It separates itself, accordingly, from those which do not boast that attribute, and declines to don the common badge and number. Acolytes all and chattels, from the Corliss engine down to the candy-mixer, they are in its view—as truly so as those others, less easily classified as clearly having a will, which trot about in harness or wriggle in aquaria.

The cultured white man, as he glances above and around at this muster of his laborers, is as little apt to dwell on such truths as the Indian who makes fire by rubbing two sticks together, ignorant that he is therein setting to work the force which fills his lungs and his arteries and produces all the life there is upon the planet. He becomes more likely to recall them with each step down the nave toward the transept, for as he moves toward the great central motive-power he experiences a gradual increase of *heat*. This source of vitality is also, on a summer's day, one of discomfort, and ought as such to be eliminated; but it will not wholly down. He must accept the mighty familiar he has evoked, *cum onere*. A world of automata insists on breathing an atmosphere of its own.

No part of the exposition more vividly illustrates the changes of the century than this. Very few of the thousands of labor-saving contrivances before us are a hundred years old in even their rudimental form. Those of them which claim such an antiquity may be numbered on the fingers, and are exhibited mainly for the amusement of the antiquary. The Ephrata printing-press of 1745, on which the Declaration of Independence was "worked off," heads, and almost completes, the list, its nearest contemporary being the Pawtucket carding-machine of 1790, which was new within living memory, and dates from the same year that witnessed the introduction into England from Holland of the circular saw that gets out all our lumber and is so rapidly devouring our forests. The slide-rest for lathes came in a little earlier, but it was not till 1820 that the planing-machine, in its present form, appeared, to be followed seven years later by the first patent for a mortising-machine. These innovations concern only the working of wood, formerly the leading material, but now in so many uses superseded by iron. The hammer of the village blacksmith has grown into the steam-hammer, as tender as his lightest touch, and a thousand times mightier than his strongest blow. Cast iron, with its infinity of shapes, and appliances for

producing and combining them, is a material almost peculiar to the century. And thus we may speak of the whole tangle of tools which fills the building. In Memorial Hall everything is handiwork, for the æsthetic sense does not express itself by steam, and the chisel and the brush will doubtless be its implements thirty centuries hence, as they were thirty centuries ago. In the principal building, again, the hand and the machine help each other, art and utility combine, and the traits of the century are more marked. They show themselves, as we have said, pure and simple in the edifice we now traverse. The primeval hammer, which had since the creation only grown from a block of stone to a block of iron, and the hand-loom, as essentially unchanged since the dawn of recorded time, disappear utterly. If the former lingers at all, it is as the implement not of the workman proper, but of the cobbler, trimmer or finisher. It is an humble servitor to steam. For any semblance of a higher office it lags superfluous in machinery's first exclusive palace.

Though the tool may thus have grown to overshadow the workman, instead of being wielded by him with as short a lever as that between the brain and the hand, it is an unsound inference that the brain has ceased to act because it acts at a greater distance and through more complicated connections. Thought is here, vigorous and pervading—more of a first and less of a secondary cause, but still a cause. It is most apparent in the shaping of its means, the ends seeming to come mechanically of themselves. It operates through iron muscles of its own contrivance, to the discarding of those of blood and fibre. A century of the hard thinking of many lands is strung out before us in these aisles of iron—thinking indispensably needful to make such masses of dead matter instinct with life and motion. The study, the library and the laboratory have brought the abstract to bear upon the concrete, and translate it into new happiness and ease for man. It is a *novum organon* compared to which that of Bacon was incoherent and resultless. Useful science we may doubt if he contemplated except



THE SELLERS SLOTTING-MACHINE.

from afar; but this is still beyond that—the Science of the Useful. The hard-handed philosophers who stand in the shadow of their gigantic and many-sinewed offspring are all inductionists, and could teach the great chancellor, were he alive again, something in the application of his own processes. They have crept on from one conclusion and discovery to another, writing in wheel and lever the record of their progress, until they have learned to think in iron instead of words.

It is a hastily-formed if very common impression that the modern workman has become himself the slave of machinery, and that his faculties are blunted by being subordinated to the engines they have created. A needle-finisher or the attendant of a pin-sticking machine, out of work, is pointed to as being in his helplessness a peculiar and humiliating product of the age. Operatives who have little or nothing to do but watch from hour to hour the most monotonous movements of wheels and cams, become, we are told, miracles of stupefaction beyond

even the ploughman who spends a lifetime in contemplating the clod. But facts contradict this assumption. The dullest of factory-people are apt, as they observe the automatic movements of their senseless co-worker, to conceive points wherein this may be bettered and their condition improved. Should this aspiration take no shape and bear no perceptible fruit, the feeding and tending of their charge occupies the attention and keeps the mind more or less on the alert. The more thoughtful say to themselves that no invention can be perfect; that the first inventor left open a path behind him in which an indefinite series of improvers may follow; and that genius can, moreover, strike out new paths for itself. Hence, the wonderfully prolific activity of both rank and file of contrivers, the crowding of the Patent Office shelves, and the multiplication in geometric progression of the products of manufacturing industry. Mind and hand unite in refusing to be paralyzed by specialism and cramped by their own creatures.

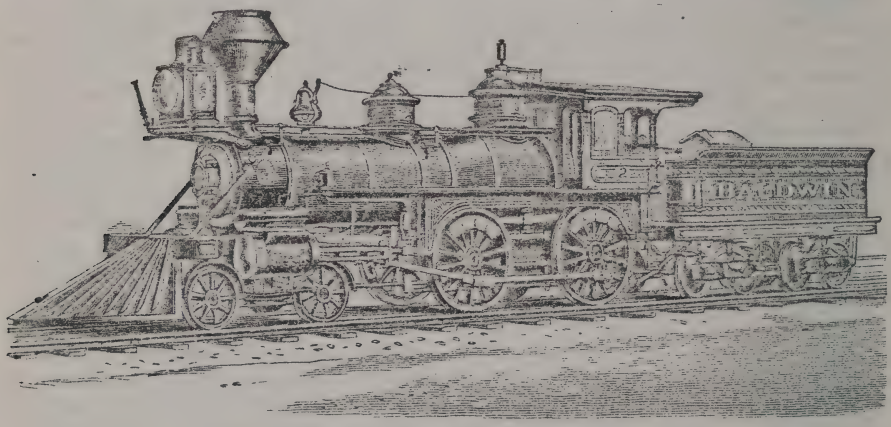
The paper-mill which figured in the indictment against Lord Say must have been a small affair—a bit of recreative byplay that served to amuse an English brook; the water loitering aside for a short interval to turn a rude wheel, and then resuming its meanders. Wind and water at that period, and for centuries after, left the horse and the ox practically man's sole co-laborers. It remained for our day to do almost everything that has ever been done in this direction, and to utilize heat as a source of power. Heat found its intermediary in water, as gravity had done before. It may employ other transmitting agencies, such as that of the atmosphere in the caloric engine, petroleum, gunpowder and gas, or it may act directly through the concentrated rays of the sun, as some of our enthusiastic engineers believe the motor of the near future is going to do. Examples of all these applications, and of the employment of electricity—another form of heat acting through the combustion of metals—are presented in the display before us.

So far, these challengers of the supremacy of steam are practically very modest in their pretensions. The Ericsson hot-air engine, which made so imposing a start twenty years ago, and moved a first-class ship, has vastly contracted its sphere, and now limits its efforts to the impulsion of small printing-presses and similar machines. For purposes requiring a power of not over four or five horses it continues to be quite extensively used; but as it yields the heavier business to an agent which is just as applicable to the smaller also, it cannot be expected to gain upon its rival. At present, it is rather falling to the rear, even within the limited field available to it.

A German invention which may be seen at work in its own and the English section claims to have gained a firmer and broader footing. This is Langen & Otto's atmospheric gas-engine. It confines itself, however, like Mr. Ericsson's invention, to small tasks, and seems seldom to exert more than one horse-power. The fuel being gas, its range of locality is circumscribed by the facilities at hand for the supply of that requisite. It is extremely simple and compact in construction, and needs few repairs. But it must show heavier metal before venturing in line of battle against steam. The "gas-motor" engine moves by an explosion of gas in a much larger volume of air. This lifts the piston and at the same time produces a vacuum, incomplete of course. The pressure of the atmosphere, causing a down stroke, does the work, the contrivance thus occupying the stage of development in which the steam-engine stood under Newcomen.

A capacity of ten horses is attained by that which typifies the petroleum class, Brayton's hydro-carbon engine. In this a few drops of crude petroleum are burned at each stroke, mixed with twenty-four thousand volumes of air. To prevent accumulation of heat, and consequent weakening of the metal, the cylinder is surrounded by a jacket in which cold water circulates—a device the efficiency of which is sustained by an experience of fifteen months. The consumption is stated at one-tenth of a gallon of oil per

horse-power per hour. At this rate, the cost of fuel is fifty per cent. less than with steam, and the saving in bulk, in the case of marine service, a still greater consideration. Sixty tons of oil, against four hundred tons of coal, would carry a ship of six hundred horse-power across the Atlantic, leaving the more hazardous character of the fuel to be set against the saving in stowage-room. We do not learn, however, that the Brayton machine has yet ventured to sea or grappled with any undertaking above the stature of a small mill. Austria exhibits another engine similarly propelled; and when we add an electro-magnetic engine adapted to sewing-machines, we have about exhausted the list of the rivals of steam. They are but motes in its light, flies upon its shaft. Its infinite range of adaptability is illustrated at the exposition by forms ranging from the semi-microscopic to the colossal, from the toy-engine to amuse a child to the monster that shakes roof and walls. In the class adapted to all work up to the heaviest one's attention will be arrested by the fine display of Wm. Sellers & Co., including their three-cylinder engine. The "Baxter," occupying, to the ordinary apprehension, the minimum of space in proportion to power, and condensed into the extreme



THE BALDWIN NARROW-GAUGE LOCOMOTIVE.

of simplicity of parts, pervades the hall and the grounds, the government using three of them, the Nevada ore-mill one, and the glass-factory one, in addition to those found, active or at rest, in their appropriate habitat. It would have been well to place by the side of the Baxter, and its compeer the Hoskins, the French balloon-engine, weighing but two hundred pounds to the horse-power. The uses which demand the ultimatum of compression in bulk are, however, comparatively so exceptional as to lessen the attention bestowed upon that point. Coal or wood, water and space, are abundant enough on this continent as yet to render unlikely the speedy substitution for the sweat of the American brow of a phial of acid, a pocket flask of petroleum, or a balloon of gas that will carry itself and help to carry him it labors for.

The circumstance that the ordinary fuels are scarcer and higher on the continent of Europe than in the United States joins with its distance from the point of exhibition to explain the predominance in its sections of these small succedanea to steam. But it does not account for the fact that the handsomest large engine shown there—a Corliss in the Belgian division—is of American build. It may be hoped that the exposition will give this class of exports a more prominent place in our commercial returns. England does not appear to have built largely upon its anticipated influence in that respect in her own favor,

the American market for such articles having been long lost to her, and that of the Continent inviting her attention in an opposite direction. She exhibits a traveling steam-crane, a pair of inclined marine engines, a heavy sugar-cane mill by Mirrless, Tait & Co. of Glasgow, old-fashioned but business-looking, and some boring and pumping engines. Sweden shows a marine engine of one hundred horse-power, heavy by the side of Cramp's compact machine of double the efficiency.

Endless is the display of contrivances for perfecting the appurtenances of the steam-engine—for saving heat, relieving the boiler from substances held in suspension or solution by the water, freeing the valves from friction, making reliable the gauges, and minimizing generally all the ills this delicate giant is heir to. This is a field quite open to our friends from abroad, and they have not been backward in entering it. All the nations indulge largely in steam fixtures and fittings. The German, French, English and Russian sections bristle and glitter with them in iron, steel and brass, copper and composition suggestive of the return of the bronze age. Aluminum, too, hints at a new metallic designation for a new epoch — that light and unchangeable, but as yet, alas! costly child of the half century, being hailed by some engineers as the rising sun of metallurgy. If so, it rather lingers on the horizon, its white light being barely perceptible in the ruddy blaze of the copper family. French taste turns into a decoration Léon & Guichard's exhaustive variety of gauges, and their hand is capped by Schäffer & Budenberg's additions, under the black and gold flag, to the gauges, governors, cocks and other minor furniture steam demands for making itself comfortable and compliant. What excuse these and the American appliances can leave it for explosions or any other symptoms of the refractory, one is at a loss to imagine, especially after inspection of the ample, anxious and painstaking provision made by Armstrong and others for filtering its feed-water and presenting that aliment in a form thoroughly prepared for healthy digestion and assimilation. The Armstrong appendix takes the lime-charged water of the upper Mississippi Valley and the dilute mud of the lower, heats it, sifts it through sand and cloth, and delivers it to the boiler pellucid as when it first left the womb of the mountain, innocent of all taint of earth. At least, this and other similar attachments claim to do so; and formidable masses of silicates and carbonates extracted from boilers which knew not Armstrong and his fellows are paraded before the appalled traveler in evidence of the fearful peril of neglecting such precautions. Lithotomy is a difficult operation in the case of boilers, and the calculi which infest their viscera are more satisfactorily treated by prevention than by cure. The Swiss might perhaps advantageously employ these complicated filters for putting an end to the cretinism caused by the Alpine waters.

Locomotives and steam fire-engines outshow their stationary congeners. The absence of foreign engines in the former class is to be regretted, though easily enough accounted for by the want of commercial motive for exhibiting them to our railway-men. They have a solitary representative, the little "Nyhammer" from Sweden. The American machines are all of one prevailing type, differing in no essential point from the construction used for the past forty years by the great Baldwin Locomotive Works of Philadelphia. The only peculiar forms of engine known upon our roads, the grasshopper and camel-back engines of the Baltimore and Ohio Company, have lapsed into antiquity, and the iron horse varies as little in appearance and plan of construction as his predecessor of flesh. Within the past few years the introduction of steel rails and improvement in other respects of the permanent way have increased the speed of trains, and it seems impossible that the enormous friction of two-foot "bogie" wheels and five-foot drivers should much longer be submitted to: the seven-foot tires exhibited by the French and Germans sufficiently express the European conclusion on this point. It is certainly singular that an interest in which the Union

leads the world should be so barren of new ideas or striking adaptations of old ones, and this while in at least one point —the waste which scatters over fields and passengers eleven per cent. of the fuel unconsumed—the call for reform is clear to a tyro. Fire-engines, another American specialty, are arriving at a like fixity of working model, loaded as they are with variety of ornamentation run mad. Their

VIEW OF HYDRAULIC BASIN.

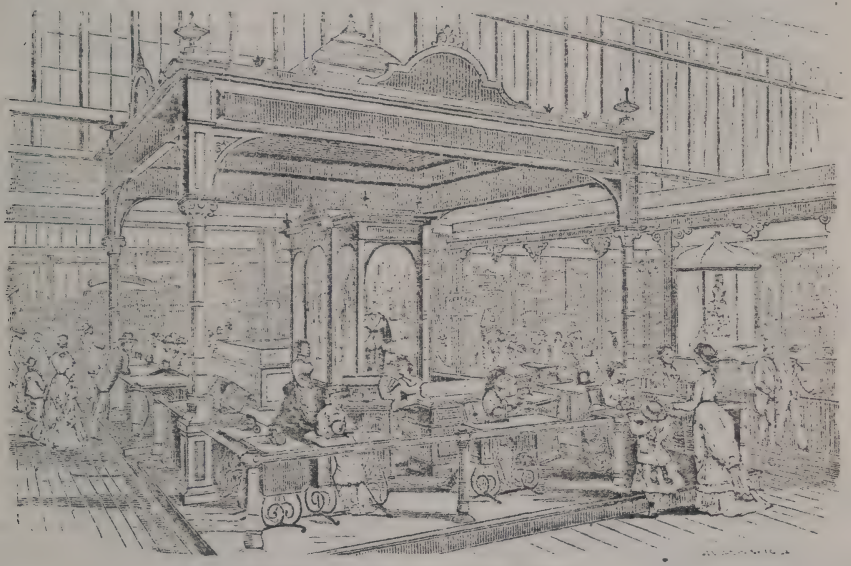
glitter makes gorgeous the sober court of Tubal Cain, and the corner which they particularly affect is absolutely dazzling. That region borders with a double fitness on the province of hydraulics, with which they are associated, and weaves interlacing jets and sheets of falling and rising water with their sheen of glass, silver and brass. Canada and Poland are our only competitors in the pomp of locomotive syringes. Warsaw sends a serviceable-looking engine designed for both steam and hand power, with seats for four men. It comes a long way, perchance to symbolize the fact that the fires of that stormy land are at length out, or at least reduced to manageability. A century ago its contributions, anything but antiphlogistic, were Kosciuszko and Pulaski.

Road-engines, of which at fitful intervals we hear so much, are almost undiscoverable. Fitts's is the only one contributed from the United States. We need first the roads, and to that end a more gracious winter climate. Alternations of frost and thaw are hostile to a solid foundation for movable machinery.

Machines for driving water and machines driven by it are collected together in the annex which bears, with some confusion of terms, the title of "Hydraulic." Turbine-wheels and steam-pumps here jostle each other in endless variety, with bewildering disregard of character and object, nearly all of them obtrusively busy, and each claimed to be the best of its class and to utilize the highest percentage of power. In fact, however, there is no wide range of comparative efficiency among them, so few and simple and inelastic are the principles governing their action. A given area of steam-piston will raise a given volume of water to a given height, and a given diameter of turbine and head

of water will perform a fixed amount of service within very moderate limits. The might of Niagara, the dead capital of force that slumbers as yet unused in the great fall, may be measured to a dot, without much regard to whose patent is to transmit its energies—whether compressed air is to bear them a score of miles or a monster raceway lead them halfway across New York. The Cornish pumps, a hundred years old, are still preferred by English miners. Of substantial novelty in the hydraulic department there is little.

The same general remark may be made of the other contents of Machinery Hall. That is, we do not perceive any commanding discovery of recent date that



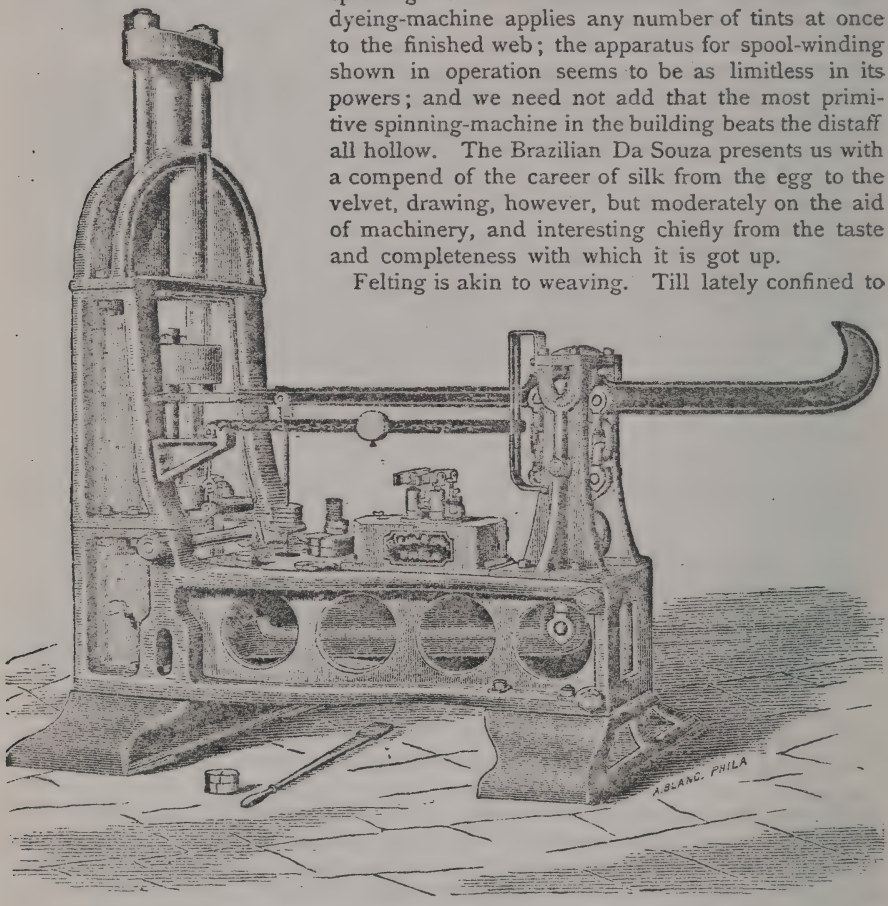
VIEW OF SEWING-MACHINE SECTION.

promises markedly to change or impel the current of industry in any of its channels. Very possibly some embryo innovations lurk among the crowd of contrivances and the whir of activities that embody the mechanical progress of the day. Where thousands of searching minds and practiced fingers have hold of the problems of physics and their special adaptations, there must be results in every stage, from inchoate to complete. Many such germs may lie around us, unnoticed and unknown, to develop within the next decade or half decade into something the greatness of which we shall chide ourselves for not having detected in the bud. But the common eye must for the present be content in its blindness, and yield to the impressions that here reach it. It sees mechanical advance moving with the broad and steady wash of the tide, and not with the leap of the freshet.

Here are Jacquard and Arkwright in no end of flounces and furbelows, put through paces and poses astonishing and charming, but the same beings at bottom. From the heavy job of carpet-weaving and the humbler employment of making a fraudulent but specious woof out of shoddy, to the lighter pastime of multiplying initialed badges, bookmarks and suspenders, they are exhibited at work. The prehistoric shuttle is used throughout, unless we may credit Mr. Dorman with having broken its sceptre by his patent of last year for weaving without shuttles. He certainly does weave without shuttles, and it may very well be a mere fancy of ours that his loom has a jerky and halting motion discouraging to hopes of a long life and a brilliant career. All that

can be positively alleged is that he is as yet in the minority, like Galileo, and that the ancient little block manifests not the least symptom of failing in the tireless revolution it has kept up since fig-leaves went out. Its adjuncts for dyeing and spinning are more modern and varied. Butterworth's dyeing-machine applies any number of tints at once to the finished web; the apparatus for spool-winding shown in operation seems to be as limitless in its powers; and we need not add that the most primitive spinning-machine in the building beats the distaff all hollow. The Brazilian Da Souza presents us with a compend of the career of silk from the egg to the velvet, drawing, however, but moderately on the aid of machinery, and interesting chiefly from the taste and completeness with which it is got up.

Felting is akin to weaving. Till lately confined to

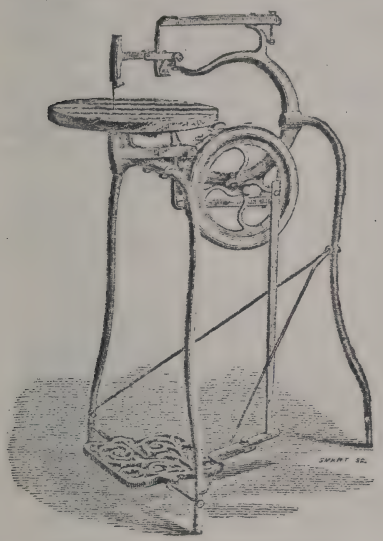


RIEHLÉ BROTHERS' UPRIGHT TESTING-MACHINE.

the thatching of the human cranium, it has extended to the roof above it. To such components as wool and vegetable fibres it now adds a mineral. Asbestos roofing is the latest form, and cheapness will soon make it popular for a certain class of buildings. The English exhibit a solid-looking roofing-felt at one penny a square foot.

The shaping and fitting of cloths has gained more in rapidity than the weaving. The sewing-machine, not a generation old, has passed from the list of novelties. Youthful and gay enough, however, is the parade of pavilions and upholstery with which it enlivens a long extent of one of the aisles. England, Germany, Austria, France and Belgium step as defiantly to the front in this muster as though it were entirely of their own origination and America were only an eleventh-hour accession to the line. Their machines are all based on the Howe invention, and are essentially American, unless we concede the equivocally-worded claim of a Belgian exhibitor, that his is the "only one that infringes no American patent." He cer-

tainly disposes by this declaration of the pretensions of his European fellows; and as for his own, sound or not sound, it has not the air of being in serious danger from piracy on this side the Atlantic. The foreign machines can still boast some merit in the comparison of cost—



BEACH'S PARLOR SCROLL-SAW.

an advantage counterbalanced by their greater weight and unwieldiness. A very inexpensive machine on a more strictly American model comes from Dresden.

A natural tender to the sewing-machine is that for cutting out clothing. This whirls out a dozen garments at once, *en bloc*, and completes the degradation of Snip from an artist to an ordinary manufacturer. Our grandmothers have shared his fate, and been similarly disrated. The knitting-needle is snatched from their venerable fingers, stuck perpendicularly into a disk, and set rotating to the tune of nobody can venture to say how many stockings, nubias and antimacassars per diem. There is a certain pathos in the aspect of the feminine crowds gathered about this most irreverent of revolutionists. Their minds are busied with memories of the past, of the winter-evening fireside, of the calm flow of wise saws and modern instances broken only by pauses to count stitches or to cast a super-spectacle look at the performance of the present students of machinery on their stools across the hearth. But the nineteenth century cannot wait even for grandmothers. The last bastion of the domestic castle is stormed by a darning-machine. It remains only for some coming Wagner to add the chirp of an artificial cricket to the music of the future.

From this raid into the interior we are recalled to more ponderous themes by the sight of an immense iron wheel devoted to the drying of paper collars. This monument to sham, like that reared by London to religious animosity, "like a tall bully lifts its head" above such respectable, laborious, useful and burly burghers as Morris's blast-engine, the noiseless Weimer engine and the immense erection for compressing cotton. It is but a part of the appliances of a new business that has spread into great dimensions and brought most of the American people within its yoke and manacle — a smooth and hypocritical tyrant that enslaves youth and beauty. But these fashions exhaust themselves by excess. Soon we shall have sham paper collars, then enameled skins, and then the costume of Vortigern's Pict, and the fever called buttoning and unbuttoning shall be, as Poe crayed, ended at last.

Let us get out of this depressing atmosphere of fraud, and seek once more the solid. Here is something about which there can be no mistake. It is a "long, low, rakish" structure of iron, with a pile of clay and a Teuton, to outward seeming almost as argillaceous, at one end and a pile of bricks, with a similarly-decorated duplicate of Hans aforesaid, at the other. This comes all the way from Germany, and exemplifies one of the means by which Berlin has been built up, Von Moltke illustrating the other. Performing its task partially by hand, the German falls behind the American brick-machines—those exhibited by Chambers, Lafler and others, for instance — which use steam or horse-power throughout. This building-material is amply displayed. Not so with artificial stone, the existence of which new form of concrete

would hardly be apprehended from anything to be found in the hall. Among other machines for working metal, stone and wood, the profusion makes it difficult to select for mention. The United States alone have two hundred and forty entries under this head, most of them tested by experience. On the list appear stone-dressing machines from New York, Rutland (Vermont), and Philadelphia, that of Batley & Co. being adaptable to many forms of moulding. England exhibits one. Stamps for imitation stone in sheet-iron and zinc are prominent. But there can be few more important means of extending the use of iron than simple and convenient apparatus for testing its strength. Some of the visitors of Machinery Hall are usually grouped around the Upright Testing-machine of Riehlé Brothers of Philadelphia. The enormous force exerted (the firm make the machine of a million tons' capacity if called for), and the accuracy with which it is determined to a pound, are sources of wonder to the uninitiated and of admiration to professionals. A compound parallel crane beam, multiplying lever and hydraulic jack and pump are compacted into a small space, yet abundantly large to measure the strength of iron, stone or other material in any way, by crushing or bending. Every one who trusts himself to a railway bridge is concerned in this form of insurance to life and limb. A parlor scroll-saw, an instructive and useful little machine, as well as a profitable source of amusement, is exhibited by H. L. Beach of Montrose, Pa.

VIEW OF LOOMS.

In this connection it is impossible not to notice the iron, tools and machinery from Russia. Like the display of the same nation elsewhere, this evidence of her advance in manufactures, and of their very thorough character, is in the highest degree striking. The empire clearly possesses a population of intelligent, ambitious and trained artisans, and not merely hordes of dull peasants. The extension of her power eastward over Central Asia, backed by such attainments in the higher industries, is in the interest of civilization, and we can contemplate it with a satisfaction not destroyed by the hints here added of her command of the arts of war in her breech-loading brass siege-guns, iron-limbered field-pieces, mountain-batteries for transportation on horseback, naval artillery,

etc. The enormous Krupp gun of Prussia, isolated by its size and constructed with wrought-iron reinforces shrunk on a central core after the Brooke model abandoned in the United States navy, is an eccentricity by the side of these "handy" weapons, and no way calculated to aid in explaining the military successes of Germany. After all, the prosperity of guns lies in the men behind them. Without a good backing of that kind they had as well been left in the ore.

And this suggests the mine, suggested already by so much else that surrounds us. The mineral part of the exposition might

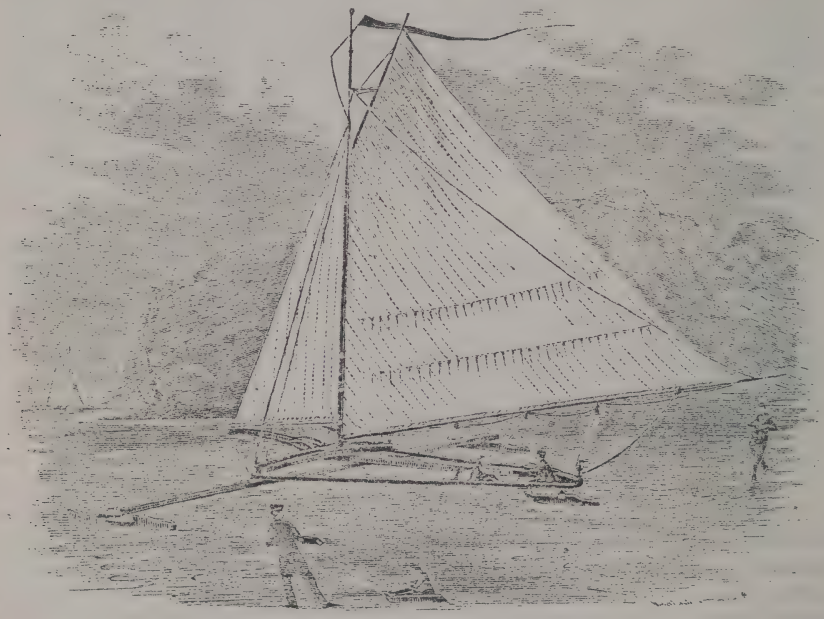
WILLIAMS'S SELF-CANTING RELIANCE ANCHOR.

be called the department of subterranean agriculture—a science so much more progressive than its sub-aërial sister. The fruits of the under-world, many of them beautiful, though none edible, and all useful in one phase or other, from the crude to the perfected, fill the allotted space and overflow into a village of annexes and outlying edifices erected by the States and individuals. Hard by, under a roof of her own, Nevada has improvised a miniature Potosi, and is coining her silver soil before the eyes of the envious nations. A little farther off the invention of the Phœnician fishermen may be seen in practice, flint and soda dropping into entangling alliance under the powerful diplomacy of heat. Scattered through all the buildings, great and little, are groups and cabinets of minerals, while in Memorial Hall the supremely beautiful enshrines itself in the fairest product of the primal fires and waters—statuary marble.

Luxembourg erects in honor of Dis an obelisk of ore, coal, and their offspring, malleable iron. Connellsville, a less historical community, tries conclusions with the debatable duchy in an array of the famous coking coal of the Monongahela. Tennessee and Virginia in turn illustrate the seams of the Holston and the Kanawha. Ohio shows her grit in a pillar of millstones, Doric in style, but more flowery in design than we are accustomed to find that simplest of the orders. France has the nearly native, yet new, metal of ferromanganese, a combination of manganese, in proportions varying from thirty to seventy-five per cent., with iron. The system of combining metals in the act of reducing them from the ore at the mine's mouth, as it were, is attracting increased attention. The union in the furnace of different qualities of iron ore, so as to unite toughness and strength in degrees demanded by different purposes, is an old and familiar practice, but, with this exception, it has been universally customary to separate the pure metals from each other in the unions Nature usually forms between them, and reproduce the alloys subsequently. Many of the new metals are found habitually in close association with the more common ones and with each other, and the difficulty of extracting them and using—or even preserving—them separately is a motive to the method of effecting a compound at once or utilizing one already made.

A large though very far from exhaustive exhibit is made of the present condition of the art of mining. The leading appliances for sinking, draining and ventilating mines, rock-drilling, coal-cutting, hoisting and shipping, are shown. England sends a powerful coal-cutter, and another, operated by compressed air, comes from Brazil, Indiana, in the block-coal district of the Wabash. The slow introduction of a metallic miner that has nothing to do with unions and strikes is rather surprising, but its very advantages in that respect probably militate against it as rendering it unpopular with those whom

it would supersede, and who cannot be wholly excluded, at first at least, from its control. Labor-saving machinery, as with the power-loom and the threshing-machine, often has a hard fight for existence in the open air, where its allies are at hand to aid it, and all favorable conditions can be made the most of; but its chances are much poorer when it has to wage unequal battle below ground alone with its enemies, actually in their hands, and beyond even the eye of its friends. The introduction of the atmosphere by a compressing-engine ought to be strongly in its favor, as depriving its guardians of some of their pretexts for hostility. Against power rock-drills for opening tunnels they seem to have given



ICE-YACHT.

up the contest. These are employed everywhere, from Hellgate to the great tunnel through the Styrian Alps. Specimens of them abound here, with the vehicle for conveying force from the outside, and the detached bit, pointed with steel or iron, which eats its way into the living rock. These little sappers of the globe are prominent in the Canadian section. They are numerous, of course, in that of the United States. In striking contrast with them in point of size is a boring-machine from Belgium. Its suspended cataract, "that on the curve hangs pausing," of great drops and chisels, would seem planned to take Pluto by storm instead of sap, and pound an opening through the vault of his domain comparable in dimensions to Symmes's Hole. It is an exaggeration of the California driven-well apparatus, which contemplates the resistance of earth only, and that for a moderate depth, and can in some of its sizes be carried out by a picnic party and brought home with the spoons in the evening.

Whatever the motor in mining, respiration is a necessity. Ventilation may be effected either by special means or by the blast-engines which torment the atmosphere in several parts of the hall. In this field we observe little novelty. Modern miners breathe better air, and more of it, than those of sixty years ago, and fire-damp explosions are less frequent; but the latter still occur, and the Davy lamp remains the best friend of

the toiler below. Nothing can be invented that will altogether obviate the danger from sporadic "pockets" of inflammable gas, and all precautions possible short of that may be said to have been taken to prevent loss of life in the extraction of mineral fuel. In mines of other kinds this risk is little known, and the labor and expense of raising the ore is complicated with comparatively little peril. Those items, indeed, are reduced to a minimum in the procurement of the chief metal, iron occurring for the most part in superficial deposits. Such is the case in the United States, the coal needed for its reduction frequently accompanying it on or very near the surface. Where this fortunate association does not exist, it is still found more economical to carry the ore to the fuel than the reverse; no new improvement duplicating that made forty years ago by the invention of the hot blast, which reduced the requirement of eight tons of coal to each ton of iron to three tons. The saving which has since been effected is comparatively small. The iron business, aided as it is by a fertility and vigilance among inventors not heretofore excelled, advances with steadiness and rapidity, but receives no such abrupt impulses. Great hits in the arts as in literature follow in their genesis laws of their own, and occur phenomenally, without regard to the activity or lethargy of the time in which they appear. Among the hundred and twelve thousand United States patents added between the first of January, 1867, and the first of February, 1876, very nearly trebling the number—sixty-one thousand—on record at the earlier date, it would be impossible to find one of the great discoveries which mark industrial epochs, such as the cotton-gin, chloroform or the electro-magnetic telegraph; although, judged by the mass, they evidenced unprecedented activity among inventors.

The United States, though prominent among mining countries, the yield of its mines reaching a yearly value of some four hundred millions of dollars, is not so in the proportion of five to one over all the others combined, as its share of floor-room in the mechanical hall and its annexes would imply. England and her colonies largely excel us in annual income from this source, and Germany, France, Sweden, Spain and Russia produce out of all proportion to their allotment of space. Had it been possible for them to adequately illustrate their methods in so ponderous a branch of industry, our metallurgists would, instead of looking into each other's familiar faces, have been able to draw instruction from without. A like remark may be made on the other features of the display in this part of the exposition. It can, however, be only matter of regret, and not of astonishment, that the international idea is here so little prominent.

The transition from the mine to the ocean, from deep to deep literally, is not so violent as it would have been before the sway of iron extended beyond the land, and metal came to supersede timber in so many marine uses, military and commercial. Steamship shafts from the forges of this country, England, Germany, Sweden and Russia are the largest masses of malleable iron on exhibition. Next to them in weight are the segments of armor-plates, eight, nine or fourteen inches thick, the battered condition of some of which from the British dockyards, half penetrated by solid shot at thirty paces' range, proves that metal mightier still is kept afloat. A trophy of propellers from an American yard, dwindling vertically from that which sends the mail-clad ram into action to the busy little wheel of the harbor-tug, is additionally eloquent of the placing of modern navigation on a metallic basis. The anchor, formerly the one bulky appendage of iron to a ship, is scarce discernible among the rest; and we should leave the exhibition under the impression that Hope had found no new pattern for the prop which has allegorically sustained her through so many centuries but for our eyes resting suddenly on the "self-canting reliance anchor," exhibited by J. T. Williams of Philadelphia. It claims to have double strength, as holding by both flukes, to hold in any depth or at

any range, to be incapable of fouling or injuring a vessel's hull, to be lighter and more convenient in handling, with other advantages. That it is not too early to introduce improvements of some kind into the ground-tackle of ships is evident from the loss of seven hundred and forty-eight in two years from failure in that part of the equipment. A ship's anchor is as a house's foundation: it must be beyond suspicion, faithful and indubitable, by day and night, to stand on or to sleep on. Held by it, a ship rests on the floor of the sea, and in the instant that it fails her she changes into a mass of helpless drifting lumber, threatened with, and threatening to others around, utter disintegration. After so many ages of bad holding-ground and bad ground-tackle of one sort and another, are we to hope that ships and men have found safe anchorage at last?

From the iron grapnel, rising, we strike the iron hull. It has wellnigh ousted, for the long voyages that link the continents, the *robur et æs triplex*, although the brass or "composition" or copper remains there sometimes to take care of the iron and protect it from that chemical Lurlei, the nymph Oxygen, ever eager to drag it down, atom by atom, to her museum of spoils that have suffered a sea-change.

LYMAN'S BOAT WITH BOW-FACING ROWING-GEAR.

So insinuating are her fingers that the minutest crevice opens a pathway to destruction. A rivet, not loose, but only beginning to be loose, is opening enough for the powers of decay to commence action; and the bolts that hold the sheathing to iron or wood are so many weak points the enemy is ever watching. Hence the interest inspired in the nautical breast by a "new plan for planking and coppering iron ships," whereby these subtle inroads are shut out, no fastening passing through the skin of the part immersed. To a landsman's eye it looks intricate and unpractical, but to the salt and his shipwright it may be the acme of simplicity. Very few of us can carry a cool judgment down to the kelson of a ship, and we must perforce leave such questions to the experts who possess that faculty. The passenger, in fact or in expectancy, shrinks from inquiring too curiously into them. The details of his castle-prison present to the scrutiny of his untutored eye so many weak points that he prefers closing it and taking his safety on trust at the tarry hands of the sea-dogs who watch the storm. It is not reassuring to see the billows dashing against the little disk of glass which constitutes your only link with the light of day, to finger the half inch of sheet iron that frames it and yourself, and to pick away the thin backing of soft wood

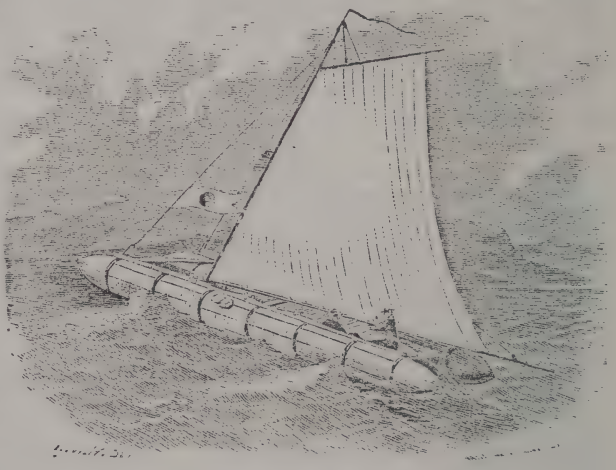
that serves no visible purpose but to prevent the crumpling up of the sheet iron at every thump of the sea. Still, if we must consider these surface perils, it is a relief to know that they are not aggravated by the eating away of rivets beneath. It is a further and more palpable comfort to dwell upon an ample outfit of life-rafts and such-like last resorts. And these it is more pleasant to contemplate at one's ease on dry land, hoisted on trestles where you can inspect them all round, and described in handbills rich with the utmost resources of the typographical art. Of these friends in need the two great maritime powers, England and the United States, offer us several. The Rider raft from New York looks simple and serviceable, and we shall certainly try it when we are shipwrecked if it be at hand. In these hot days it has actually the air of a luxury, like a great hydrostatic hammock, the long supporting tubes in their casing of cool gray canvas offer so pleasant a couch for rocking on the bosom of the deep and looking lazily through the spoon-drift for the rising of a new Aphrodite. Should the sun grow too warm even there, all we have to do is to roll over the side seal-fashion, and holding on by convenient loops to disport ourselves *ad lib.* Nor do we see why this contrivance should remain among the exclusive attractions of Old Ocean. Anchored in an inland pond, the head of the family might smoke the paternal pipe while the encircling youngsters hang in suspense from the edge, surrounding him with a glittering nimbus of paddling feet. Its aptness for certain ecclesiastical purposes is still more obvious. The officiating clergyman on a baptismal occasion could perform his duties dryshod. Distributing his postulants in the water, each floating from a rope-handle, he could pass around the gunwales, stooping to administer in succession to each head a bob and a benediction. But we apprehend the inventor never rose to the level of such applications of his idea. If so, he is welcome to the suggestion: we claim no compensatory share in his patent.

Other dangers than those inseparable from the sea are considered in the exhibit, and considered from both sides, offensive and defensive. We walk among torpedoes—an article, by the way, rather oddly placed in "Aërial, Pneumatic and Water Transportation." Though in a certain sense designed for aërial and pneumatic transportation, we should have classed it in "Hoisting Apparatus." However, as has been before remarked, it is difficult, in so vast and heterogeneous a collection, to get everything into exactly its proper place. And then torpedoes are new. They belong to the beauties of modern civilization. Shakespeare was the first who was able to make a simile out of the petard, and even he, unfortunately, lived prior to its submarine employment. It belongs, in the latter shape, to the private poetic properties of nineteenth-century versifiers. It is not yet fully available to them, nothing but its perfectibility having been established, its perfection remaining for the future. The torpedo and the ram, and not the fifteen-hundred pounder, are the destined tormentors of the iron-clad, even as the sword-fish and the thresher are the worst foes of the whale. Naval battles are not going to be decided by a gun which can be fired but once in half an hour, with the chances ten to one against its striking the mark then, or piercing it if struck. The sloping surface of the circular turret or the tortoise-like casemate is practically protection enough against a few large guns; and large guns must always be few. Not so with torpedoes, stationary and automatic or locomotive and manned. The forms of these are numerous, and all are more or less efficient, all being at the same time cheap and comparatively easy to improvise. Sweden sends hither a model of a torpedo-boat, and there are several others in the hall, independently of the much more complete display in the U. S. Government Building. Not that a complete display of these Pandora secrets is to be found anywhere. All the governments reserve something *quoad* the torpedo. They sit around the green board of the sea engaged in a particularly quiet game of brag—which lessens the wonder that one of our leading dip-

lomats should have distinguished himself in poker.

On the defensive side of the gunpowder debate we observe, among an array of armor-plates of steel and iron, a model of a vessel with sloping iron sides supported by powerful springs. The shot strikes the fender, which yields and is sent back to its place as if nothing had happened, ready for the next half-ton missile that may come against the spring from the bosom of yon dropping cloud. This is a home device, but not altogether novel abroad. England has tried everything in the way of ship-armor. She sends now a model of her turret-ram Alexandra, the pink of what in old days were called her wooden walls. Like its predecessors, several of which have sunk in the most inexcusable way, while none have ever won a battle, this latest of her iron-clads must be set down as another costly experiment. A torpedo-fancier might apply to the best of them the comment of The Chicken on Mr. Dombey—that he was "a rum-looking cove, but he thought it was within the resources of science to double him up by a blow judiciously planted below the waistcoat."

Great Britain sends better things of a more pacific character in the way of shipping. She and her daughter the Dominion are strong in models of dry-docks, ships and their parts, the latter not forgetting her local canoe of birch-bark and ash. The United States is more closely pushed by their exhibition in this department than by all the rivalry excited in any of the others. Where lies the victory it rests with the judges to say, or perhaps not even with them, the spirits of the storm forming the bench of ultimate appeal. What is certain is the extreme beauty of the forms which spread their mimic wings or their real oars on the boards of our builders. All craft appear there, from the racing-shell to the trans-Pacific steamer. An interesting novelty is a rowing-gear which reverses the old position of the oarsman and sets him with his face in the way he should go. It is a very simple combination of levers, invented by W. Lyman, and has other advantages besides the chief one. The bow, for instance, is raised instead of lowered by the stroke, there is no noise, no catching of crabs, and no danger of stumbling into the water or through the bottom of the boat over rowlocks or thole-pins.



THE RIDER LIFE-RAFT.

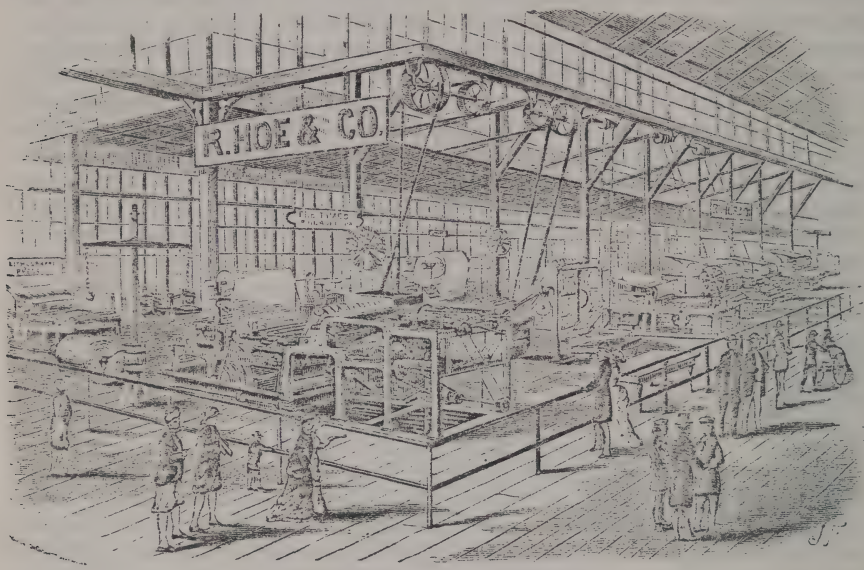
If the old adage of the shipyard, that the prettiest model is the best model, holds good in the days when anti-æsthetic steam has dethroned the clipper, then ours is the foremost position. The three-masted schooner, which the high price of labor has made the specialty of the American commercial navy, is not so beautiful as the clipper, but shows well afloat by the side of the square-rigged ships of half its tonnage sent to our ports by the minor trading powers of Europe. The contrast is that of a giant in the gristle to a dwarfed adult. Could the ice-yacht, of which a full-grown and richly-dight specimen is contributed by one of the merchant-princely house of Grinnell, be credited among our craft as more than

a toy, it would lift them above all competitors. But it is as strictly local as the balsa of Lake Titicaca. Ice, in fields thick, smooth, broad and long, is one of its demands, but not all. There must be no coating of snow. Thus it is that the ice-boat confines itself to the reaches of the middle Hudson, and has seldom been able to exhibit its marvelous speed elsewhere. The utilizing of the great lakes as winter highways is a problem yet to be solved. Six or eight first-rate cities are fain to stare out, for six months of the twelve, upon a smooth and perfectly level expanse which unites them with each other and with an adjacent population of millions, and to see it rest blank, barren and unused year after year. So it may, for aught there is yet of promise to the contrary, when the curtain of Niagara shall have given place to a palisade of turbine-wheels, with the channel below filled only by back-water from Ontario.

A few years ago paper or paper fibre was in great vogue as a material, chiefly for decorative furniture, but often for more substantial uses. Japanese example gave it a fresh impulse, but we now hear less of it, and to come upon paper canoes is something of a surprise. There they are, however, light as paper pellets of the brain, and weighing fewer pounds per passenger than we care to quote. It is improbable that the canoe stage will be passed, much less that paper, great as have been its services to navigation, will ever float us across the Atlantic. Financiers, journalists, bookmakers, and those other paper-stainers who enlighten us in the extreme north-western corner of the hall with the spectacle of a machine solemnly grinding out colored hangings with a facility and mathematical precision that would make the fortune of a penny-a-liner or a popular poet, will keep the price of it above that of timber and iron, and prevent its extensive use in ship-building. That they are providing plenty of use for it is proved by the long rows of presses and other printing appliances, from Hoe's first of the American lightning machines to MacKellar, Smiths & Jordan's elaborate apparatus for casting and finishing type, which, headed by the wall-paper establishment, stretch along the north side of the building. These are all modern, sharply distinct from last century's tools of the art preservative, and throwing Faust and Franklin back into contemporaneous antiquity. The lever and cheese-press which served the Caxtons, the Aldi, the Elzevirs, the Tonsons and the Woodfalls, and squeezed into immortality the brain-products of three mighty centuries, have disappeared for ever. In place of them, iron complications which among other things imitate exactly the fingers of man, with fifty times his strength, roll off from a continuous ribbon like that of the wall-paper machine three hundred printed sheets each minute. The undergrowth of this forest of intellectual giants bristles up in a tangled maze of job, proof, engravers' and lithographic presses, with, below them yet, a turf of tertiary contrivances ancillary to the great trade of multiplying words. All are, or may be, driven by steam. Only the compositor and the composer are still irreducible to cylinders and eccentrics. The former of these has repeatedly been menaced with that fate, and in the opinion of some the working of him by a piano keyboard is a question at most of years, perhaps but of months. And then—the other man? Himself a vapor, in perpetual process of exhalation, how chemically trivial the additional step of replacing him with steam! Is the globe to be blanketed in a fog of literature wherethrough shall be discernible but two figures—the publisher and the stoker?

Such apprehensions oppress us as we stand before a platform covered with a maze of machinery—an iron despotism tempered very slightly by female influence, the young lady who stands by having but little to do, being in fact but a fair *etcetera*. A sheet of white paper lies upon a metallic plateau we may call the council-board. Motion commences: the sheet runs into one opening, disappears, and comes out printed. Before we have time to glance over it and catch its leading ideas, pop! it sinks into the clutch of certain fingers that grope around for prey like those of Victor Hugo's cuttlefish. When we next see

it, it is folded in pamphlet shape, ready to traverse the mails in search of the independent voter and tell him which candidate for the Presidency is the real Simon *Pure* who is to herald the Millennium. We reach forth to take it up, but it once more quickly eludes our grasp, for it must hurry to be stitched and keep out of the way of a long succession of brother broadsheets impatient for the same attention. That done, it is not yet complete, but twists and dives into various recesses to be pasted, covered and trimmed, emerging finally a finished brochure, ready for



HOE'S PRINTING-PRESS EXHIBIT.

the hand and the perusal of the daintiest of "sovereigns."

Art as well as literature slides into the omnivorous maw of machinery. Light joins forces with steam, and translates the ray into printer's ink while we stand and look on. France has photo-lithography in full operation. Colors she cannot as yet catch in that way, but mechanism is called to the aid of the chromo-lithographic process, which dissects a picture into its several tints as an anatomist does the layers of tissue, spreads them out and recombines them in thousands of copies so deftly that the original creator would for the moment be puzzled to distinguish his own work. This method, so suggestive of that Alston fabled in his *Fire-King*, we come upon also in the American section, where the successive courses that build up color-masonry are spread out before us flat and raw. At first thought, the passing of genius through this ignoble alembic does not leave a pleasant impression, but when we reflect that mechanism, whether in iron or a worsted jacket, is but mechanism, and needs something to copy, and calls for more the more it gets, we realize that originative thought is led into wider activities and dominion by these its busy heralds and missionaries. Wider, we say: higher, we do not venture to add, for the chromo level of art, like the patent folding-machine level of literature, is as yet rather broad than elevated. It has to spread over the masses before it begins to rise.

Reference to woman as an ally of machinery is unavoidable to the observer here. On the heavy side of the arena, where beams of many tons are brandished aloft, cannon cluster, vast cotton-presses, tilt-hammers and sugar-mills collect their forces, and steam vehemently hisses its protest against fet-

ters, she does not prevail. Nor do we see much of her among the pumps, save as a spectator and a fugitive from heat. But where engınery assumes dimensions and shapes that do not exclude her, she is as sure to take root as the fern in the crevice or the saxifrage on the lichen-softened rock. The sewing-machine, which was to have made her a superfluity, has proved to her a new weapon. It may be said to be helpless without her. So with watchmaking, which is appropriately placed in the same range and joins in continuing the female line. Before the Waltham and its fellow-American companies applied power to the manufacture of timepieces female labor was little employed upon them. Now, it predominates over male, if we may judge from the aspect of the pavilion. If we cross over the way, we find female influence powerful with the press. And its gentle current trickles through a multiplicity of other channels. It irrigates the sweet and smiling fields of confectionery, and bonbons bloom in its path, bright, succulent and smoking hot. It deviates into soap, and your initials spring into sight on aromatic cakes as when written on the sod in crocuses. Then it meanders with the shuttle along the many-tinted web, and gives us the carpet we tread on, the cloth we wear and the ribbon we return as a feeble tribute to its maker.

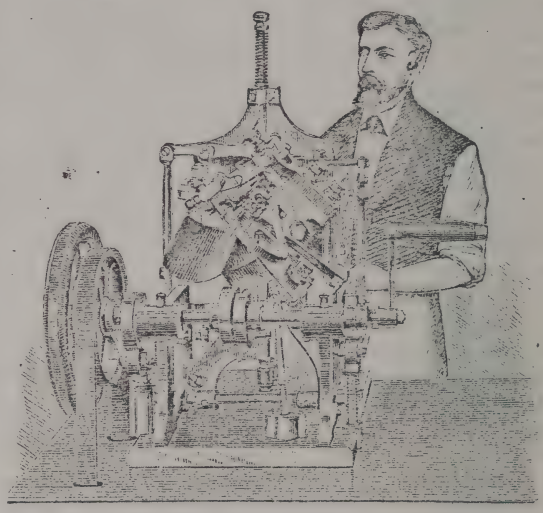
Here, on the north-western aisle, wells up music of another guess kind and from a widely-different source, the only articulate music these wooden rafters re-echo. It is genuine negro minstrelsy, free from any adulteration of burnt cork, and voices tender memories of the coon-hunt, the old folks at home, 'possum fat, the terrapin, and other bright spots in "quarter" life. The warblers are engaged the while in fabricating Virginia chewing and smoking tobacco. The Old Dominion, unfortunately, puts in no other appearance at the exposition. She laps herself, perchance, in the notion that the mighty shades who gave the country its political impulse, and whose informing force may be said to speak in all the rich fruitage of free institutions, are exhibit enough for her. They are a brilliant contribution, yet one that would have been all the more so accompanied by the more tangible offerings she could so abundantly have made. We should have liked to see her do honor on this spot to Jefferson, the natural philosopher, plough-inventor and ardent promoter of education, and to Washington, the pioneer and farmer.

The Northern industry of ice-gathering, a new one on its present scale, illustrates itself more silently by a collection of the tools and structures used for the frozen harvest. A machine for making ice, exhibited by a French firm, indicates that our Northern reapers of the frost have new customers to gather in. These ice-machines are not only employed on the Continent, but in some seasons they have been found profitable in New Orleans. The great reduction in rates of toll to which our leading railways have lately found themselves constrained and able to submit, will ere long cause the supply of the interior and South with the thick, solid and clear ice of the lakes. One of them already supplies all its passenger-cars and station-houses from that source, transporting it five or six hundred miles at times when traffic is dull and trains run empty. This new glacial epoch, with its southward drift like that of the old one, has but commenced. Congealed Superior will again flow to the Gulf.

In a special abiding-place of its own, most capacious, yet in this swarm of vast things secluded and easy to pass without notice, leather covers an acre, far less than a single hide in Domesday Book and the *Æneid*, and yet containing many hides, of rhinoceros and kid, ox and alligator. One should make a point of viewing this rich yet cool, glittering but sober, shrine of the oldest of all materials. The display has a homogeneousness and a unity of motive and effect not characteristic of either of the two great buildings under whose shadow it rests. Shoes, harness, cushions, gloves and the like are particularly arrangeable objects. Neatness is one of their strong points. They nestle naturally into showcases of

moderate dimensions and harmonious style, and in the larger forms they drape the walls gracefully for a background. They breathe, moreover, when new, a pleasant perfume. Morocco appeals pleasantly to two of our senses, and the kid glove, laced and embroidered, to all our sentiment. We refuse to be disenchanted by the reflection that other three letters, naming a very different animal, might in many instances more truly state the origin of the dainty "hand-shoe" that encases the *summum bonum* of the average young man. In less romantic and luxurious leather there is less possibility of counterfeit, close as the fabricators of oil-cloth come to the original, and we are assisted in the identification by the uncut specimens of the tanner's art which festoon certain non-obtrusive nooks. Among these, the familiar cylindrical tail of *Mus rattus* will be sought in vain. All adaptations of leather have their interest in connection with manners and history. The boot that slumps through the snows of Siberia, and the slipper that shuffles across the sands of Syria; the satchel telling of the charms of independence, and the Saratoga that chains one to the heel of the baggage-smasher; the saddle of the Plains, the "meet" and the charge; the white pantoufles that "like little mice steal in and out," and the thick-soled Oxford devoted to the breezy constitutional; the trappings of the moonlight sleigh, and the dromedary, the London beer-dray and the reindeer;—all are full of suggestive associations, and before we reach the opposite end of the annex we are half ready to accept the position of the cobbler-engineer, that there is nothing like leather.

The exhibit of shoes possesses an ethnic value. Each nation unconsciously exposes the shape and size of its foot, male and female. From this ordeal, with due deference to the five great powers, it must be claimed that America emerges with flying colors. A Frenchman might object possibly that what we see in the United States cases is not the form or dimensions of the foot, but of the last, and that a sequel of corns remains unexpressed, though not unpressed. But here arises a high moral question. Is not the sacrifice made to appearances by our sufferers under tight boots a touching tribute to the beautiful, and the evidence of an æsthetic sense that is strong enough to face martyrdom? And may we not claim that the limping victims of this lofty struggle reflect some part of their dear-won glory upon their countrymen at large?



MACKELLAR, SMITHS & JORDAN'S TYPE-CASTING MACHINE.

The leather show is, we dare say, as full as any ever got together. Little can be thought of to make it more so, unless we call for the antiquities of the trade. These, committed to the keeping of a perishable material, could not be numerous, but the buff-coat of an Ironsides, a "targe of tough bull's hide" from Falkirk, gilt hangings from the Alhambra, or a pair of pre-historic sandals from the bogs of Ireland or Northumberland, would have heightened the effect.

It is not clear to our mind why vehicles should have been so widely separated by the Commission from leather, or what

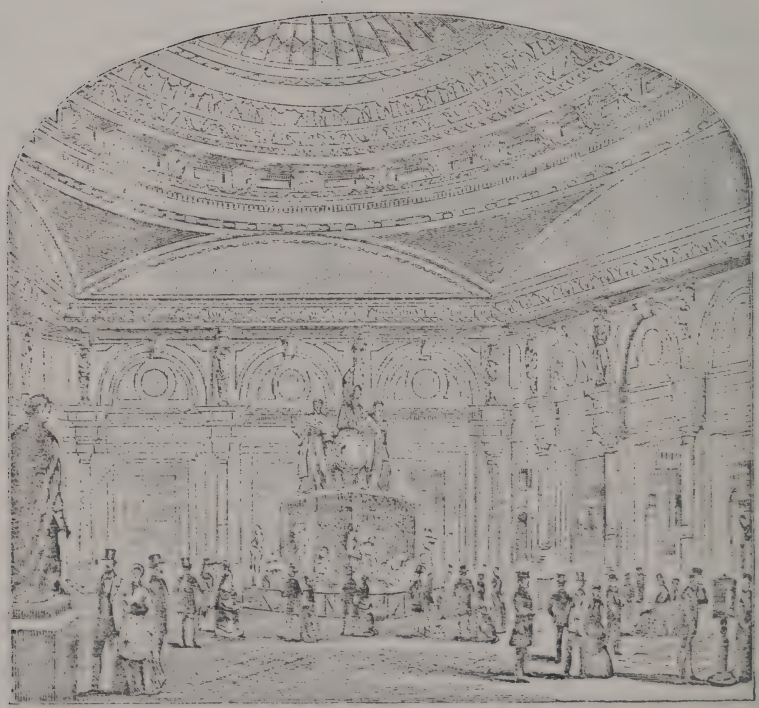
closer connection machinery has with the latter than with carriages. We take the liberty of bringing them together. It is within the memory of most of us that not only the covering and lining, but the springs, of carriages were made of leather. Such is partly the case still, and wholly the case with harness. The horse, too, we need not add, wears his own private coat of the untanned article, in addition to that of his deceased relative in a more elaborated state. The severance becomes more unaccountable when we note the large collection of stoves, furnaces, and all sorts of small iron-ware under the same roof with the vehicles.

The vehicles of to-day are, among all civilized countries, remarkable in sameness. Those of Europe are heavier than ours, though the difference in that respect is less than in 1851. The Old-World builders have taken a leaf out of our book and timber from our forests of hickory. They are more excursive in the matter of color, vermilion and yellow being not uncommon, with, as in samples of the Turin cab, pure white—a color, if color it can be called, matched on the American side only by a hearse. The English drag, carrying sixteen persons on seats of every frontage and every grade of privacy and publicity, like the seats of a drawing-room, is a sociable affair. It is the ghost, more slender and spiritual, of the departed mail-coach, and will serve to keep that institution, made classic by Smollett, Scott, North and Dickens, before the eyes of a rail-borne and cinder-blinded generation. It is nothing like unkindness that impels us to remark on a circumstance that is hardly more striking among the carriages than among the other points of the British display, distinguished as that is by splendor, variety, careful selection and distinct explanation in all departments. We allude to the frequency of such painted and emblazoned demands upon the observer's admiration as So-and-So "to Her Majesty," "to the Nobility," etc. This sort of thing does not obtrude itself in the other monarchical sections. Prussia has something of it, but in no similar degree. An analysis of the symptom is tempting. Enough to say that it does not portend the speedy triumph of Mr. Bradlaugh's republic, and that the average Englishman as "dearly loves a lord" as when he allowed the barons of the Roses to take him up by the heels and beat each other over the heads with him for sixty years, what was left of him remaining at the end of the entertainment as ultra-dutiful as ever to what was left of them.

What we see of the advance and position of mechanism is assuring, beyond most other spectacles in the great show, of the future of civilization. And its impressiveness in that regard is the greater from its palpable and necessary incompleteness, in degree and in aggregate. The fraction possible to be brought together here of the machinery daily and hourly at work in supplying the regular needs of this country and Europe is trifling indeed. Could it be all shown together, we should be astounded at the capital of thought, treasure and prolonged labor invested by the people of Christendom in machinery. What has thus been so painfully won cannot be lightly lost. No conceivable disturbance or rapid series of disturbances can overthrow it all. It has become a part of the life of four hundred millions of souls, and is constantly becoming more intimately and controllingly so as their numbers increase. It has erected a republic of industry which embraces and sustains the republics of politics and of letters. No revolution can stop the steam-engine until it is replaced by something better in its own province. It will rule on, disturbed only locally or partially, until an abler successor shall demand its sceptre. That successor must be capable, like it—and more capable—of deciding the issue of war and repairing its material damage to both parties, of bringing together mind and mind, allying them in a contest against difficulties, physical and moral, which can be lessened, but never entirely overcome, and spreading peace and culture over a cantonment too broad and many-sided to fear assault by storm, proof to anything but long blockade.

PART X.

ART.



INTERIOR OF ROTUNDA OF MEMORIAL HALL.

IT costs us no effort to conjure up the idea of internationalism as we ascend to the vestibule of Memorial Hall. It is all around us before we reach the threshold. We pass under the shadow of an enormous pile of unexceptionable

* The illustrations of this article are intended merely to serve as aids to the text in indicating the subjects and composition of some representative works.

granite shapen by American hands into the similitude of an American soldier of to-day, eloquent to contemporary eyes,

SÈVRES VASE.

but little apt favorably to affect connoisseurs of the more remote future impliedly addressed by the selection of an unchangeable material. To them the hard, meagre lines of kepi, trousers and close tunic will speak poorly for the notions of grace and beauty prevalent among those who chiseled and set up this votive offering to gunpowder. Advancing between the big Viennese horses, we perceive far off to the right a bronze lion on a much smaller scale, also from abroad, while a flock of eagles and goddesses of German origin contemplates us, with more or less of calmness, from the cornice above. Under the stately doorway we are confronted by the English group of a plunging bison, rather groggy in the legs from the weight of a bevy of lightly-clad nymphs who find a soft seat on his shaggy winter *pelage*. Around and overlooked by this singular composition cluster thick the marble elegancies and—witness the colossal bust of Washington sprouting from an eagle, and gazing upon the hurly-burly with much the air of a political roué on the watch for the next revolution—inelegancies of Italy. Just behind the east pier we catch the brazen glitter of a form that haunts the whole exposition, and Prussia stands confessed in the great chancellor, lumpish and rudely modeled in harmony with the policy of sheer force with which he is identified, and which seems to scorn the aid of mellowing and conciliatory detail. France infuses color with one or two Sèvres vases, and the United States restore the supremacy of pure form with the statuary of Story, Haseltine, Rogers and others—a task in

CONNELLY'S "THETIS."

which the sculptors we have here named are, we had almost said, led by Connelly, whose *Thetis* is conceived in the spirit of

the antique and fails to come up to it principally in the execution of the drapery, the lines and masses of which are too much broken. The world of color lies beyond, and it is by a very proper and well-considered arrangement that the chisel intervenes between it and the architectural.

That one of the assembled nations which is most adroit and profuse with the chisel naturally commands the greater share of attention at this point. The countrymen of Canova seize us with a multitude of marble hands, and from the first moment till we leave the building and its cloisters swarms from the Carrara hive surround us. We cannot escape them if we would; and can we say that we desire it? No. Did they serve no higher purpose than that of physically relieving the eye after resting, not reposing, upon acres of tinted wall, they would be welcome, and their removal would be no trifling loss. But they do much more. Taken as a mass, they are as well able to stand by themselves on their own merits as any other modern art-group here. Leaving out some absurdities, like Pezzicar's negro with a frontal development worthy the most gifted poet or statesman, and a calf that would make the fortune of a footman, brandishing aloft a written document which he never read, the average of conception and treatment is good. That of technical knowledge and execution is high—markedly above the standard of statuary among the other nations as shown by their exhibits here. Texture and flexibility, according to the object represented, are imparted to the stone; a glaring fault in drawing is almost never met with; and a combined freedom and delicacy of touch, sure to be appreciated when we transfer our glance to the works of other nationalities, is everywhere apparent. To the last-named trait may be ascribed an occasional overstepping of the bounds of the sculpturesque. Facility misleads itself, and strays into the fantastic. Among a hundred or two productions from artists of every grade it would be singular were there no worse faults than this.

We shall be the better assisted to a recognition of the merits of the higher class of these works by fancying the sensation which would follow the sending to his native home, by an American sculptor trained in Italy and living there, of such a production as Barcaglia's *Love blinds*,

BARCAGLIA'S "LOVE BLINDS."

Buoninsegna's *Slave*, Bergonzoli's *Angelic Love*, or Calvi's *Lucifer*. By the side of the *Slave*, Powers's well-known rendering of the same subject is hard in line and pose, at several points faulty in proportion, and altogether wanting in surface and in that minute truth of detail, curve within curve, which may be termed the chiaroscuro of sculpture, and which constitutes so much of the subtle charm of the best Greek statues. Within the narrower scope of a portrait-bust the Northern chisel finds a more manageable range, and there it escapes, on the other hand, the insipid sweetness into which the Italian is apt to lapse.

Barcaglia's group is from all points a study. In every aspect its "grand lines"

are sweeping and graceful, and its minor contours soft, correct and "multitudinous" without destroying unity or becoming mechanically repetitive, as a want of knowledge or feeling would have made them. This and other examples in the Italian display go to prove that if, as is often forcibly alleged, modern sculpture is but an imitation of the old, the Italians have at least not been careless in the imitation, and that if they have not caught so successfully as the Thorwaldsens, the Flaxmans and the Schwanthalers the severe side of the common model, they have excelled them in the apprehension of its lovelier and perhaps its deeper traits; and that, moreover, they have gone farther in transcending the rôle of the mere copyist and seeking the fountain-head of reality for the minutiæ of form so closely studied by the ancients. For this, not less than for the inspection of remains in marble and bronze, they have advantages over their rivals of a less sunny latitude. Their merit is to be measured by their utilization of both sources of success; and we confess to an agreeable surprise at the evidences here afforded of the extent to which they have met that criterion.

It is in the mastery over stone, in statues, tazzas, vases and mosaics, that Italian art chiefly stands forward. In painting it makes no mark at the exhibition. The few pictures shown can be assigned no generic character, either in selection of subject or mode of treatment. All themes are handled indifferently, in both senses of the word, from the religious in deference to local tradition to genre in concession to the bias of to-day. Pictorially, we should say the Peninsula was at sea. Desperately bad canvases, with the best things of the Renaissance staring at it from every wall, it cannot produce. But it appears as little able to pass the mediocre far in the opposite direction. Until this transition period shall have been traversed, and a definite course have been decided upon, it will not do to look very hopefully to the Italian easel. The people and the government are both poor, and patronage must come mainly from foreigners, whose passion is for copies or counterfeits of the old masters. The Church, being in a state of suspended animation, is out of the market, and occupies itself with little beyond the perpetuation in mosaic of old works. Still, the artistic sense cannot be smothered, as some of the specimens before us prove. A decollation of Saint John by Valaperta of Milan may be cited. It shows knowledge, which we can all appreciate, and motive, best appreciated from the devotional standpoint of those among and for whom the picture was painted.

Let us compare another projection of the antique, a Pompeian interior by Sciffoni, with the representation of an almost identical subject by a naturalized English painter who has earned distinction in his new home, the Hispano-Belgian Alma-Tadema. M. Tadema has blocked out for himself a very peculiar style. He gives you the impression of one who knows how to draw and compose, and is not incapable of aërial perspective, but who scorns to do his best in either. So he presents us with groups that resemble a cross between Limoges pottery and mosaic, the outlines sedulously intensified, the tone of a feeble yellow and the effect flat and meagre. In the Italian work, on the contrary, we find careful drawing, softness of effect and air. There is no affectation, no obvious running after the artist's individual conceits, to affront our sense of probable truth. One picture we can realize: the artificial is the first thing to impress us in the other.

Invaders appear to have lost their strength on British ground, in art as in politics. The times have changed since the art of the island was wholly centred in a succession of imported names, and when it did not even furnish the undergrowth to a succession of tall exotics like the Torregianos, Holbeins, Rubenses, Vandykes, Lelys and Knellers. Since the memorable day when the American West made for it a new Declaration of Independence against the unanimous protest of the indigenous artists, including Reynolds, and persisted in tearing the toga from General Wolfe and shield and

spear from his soldiers, it has been busily and hopefully building up a school of its own. It is difficult to realize, as we look upon the very poor effort, one of West's first and worst, which inaugurated this revolution, and established for all coming time the right of British heroes to the pictorial pursuit of life, liberty and happiness in their own clothes, that the innovation should have been so long in coming, and that it should have come finally by so insignificant a door. Causes productive of one absurdity naturally continued to breed others, and the crotchets of Fuseli, Barry, Haydon, Turner and Millais, the first and last two men of indisputable power misdirected and lost, have at intervals interrupted the growth of British art. It pushes along, however, in its eccentric insular way until it is able to offer on these walls much that is, to the Anglo-Saxon eye from whatever quarter of the globe, delightful, touching and instructive.

It must have been with a prerecognition of the sympathies to which she had this time to appeal that England prepared for Philadelphia an exhibit of her art so far exceeding in completeness that which she sent to Vienna or Paris. She knew our people could understand her, vagaries and all, and that in a country whose household engravings were from Hogarth, Wilkie, Landseer, Frith and Faed her painters would be at home. Her story-tellers with the pencil, her replacers of ink and paper with canvas and oil, were sure of an audience who would overlook some typographical errors and some crisp defiances of syntax and prosody like those in the sister art of Carlyle and Dickens. The language would reach its mark despite a stutter, and not always the less, considering how many more there are of us backwoodsmen who feel than who know in art-matters, by reason of the stutter.

Thus it is that if only for the family motive which induced the sending over of this collection the millions who visit Memorial Hall have so many acknowledgments to make to the mother-country, to say nothing of the pleasure imparted by many of the pictures. With a number of these we were all familiar before, thanks to the engraver, and they came to us like relatives whose photographs had been long in our albums. Here is the *Railway Station*, with its string of dramas in real life crowded on the narrow stage of a passenger-platform. They might all have been as truly told of a French or German station, but somehow they would not have struck us with the same force. Something in the faces, bearing, gestures and *mise en scène* would have been wrong. The happiness of the bridal party would not have been so clearly our happiness; it would not have been our child so solicitous about the pet dog; the dapper lad so proud to be off to his first boarding-school could not have been mistaken for our boy; and the burly driver in blue overalls whose touch of the valve is about to bring down the curtain would not have been so nearly the fellow who scatters cinders in the eyes of the universal Yankee nation. We do not stop to remark—we do not want to remark—that the composition is wholly devoid of unity, that the coloring is as Heaven pleases, that the carefully-finished faces are all very much alike, and that other weak points invite the critic's lance. We warm to the thing "without a why or a wherefore;" and the fact that we do, when we come to reflect, aids us in comprehending how it was that the early Christians found objects of devotion and founts of pathos in the staring dolls they placed in the Catacombs, how the Peruvians came to worship the great stone gods that remain to us, and how the pappoose and its mother in the Swedish pavilion may be a deeply-touching sight to the Laplander. If we here employ caricature for illustration, it is with no idea of depreciating the undoubted merit, in several points, of the picture cited, and some others of its class. We only mean to say that the bottom principle which determines the special effect in the one instance is the same as in the others, and that it has not much to do with the science of æsthetics, those addressed being satisfied if their art-standard, high or low, is only not shocked.

La Vendée, Mrs. Ward's *Poet's First Love*, and *Baith Faither and Mither* by Frith, are others of these painted poems that warn off—and make the spectator join in warning off—all criticism. In the first our admiration belongs to the central figure, a French boy calmly confronting, from the ashes of his native cabin and village, a storming-party of British troops; but we dwell longer and more pleasantly on the frank, homely faces of the men themselves as they bend forward surprised into homage to the brave little fellow. The picture is so ballad-like, smooth and ringing in its metre of tints and lines, and the measure is above all a home measure.

PRINSEP'S "LA VENDÉE."

The Casual Ward, by Fildes, affects us as vividly, but with less of the "happy pain" that constitutes the pathetic. This scene is beyond pathos. It is more revolting than any of the melodramatic horrors of the French section. They avowedly aim at exaggeration. This, on the contrary, is hard and simple truth—simple enough, too, in scheme, being but a blotch of London fog enshrouding a huddle of wretches who crave a night's shelter from a public charity. The artist has well studied his subject, and the sad part of the thing is that he had abundance of studies at hand. Squalor and rags, with their appropriate local setting of dank mist, are evidently as ready at his command as the sunnier accessories of English life to which we have already adverted, and which are more frequently depicted. If exact imitation is the acme of art, as in the representation of a copper kettle, a decanter or a pineapple, then this picture comes up to the requirement as well as any bit of still life on the walls; and it is, additionally, a work of imagination. The artist labored without the clog of color, or even that of strong light and shade. All is in a dim half-tone that leaves us room to dread something muffled in the murk worse than what we see. The force of the work being nevertheless more narrative than pictorial, one is disposed to regret not having been spared this glimpse at one of merry England's closet skeletons.

In passing from these portraits of society to those of individuals, we look for something to sustain the conceded eminence of British art in that walk. We see a strong, characteristic head of Carlyle, badly hung and almost invisible; one of the painter Millais, well modeled; and, better, Landseer's sketch of the present Lord Ashburton, dashed in with comparatively little regard to color and finish, like the same artist's lions, and unlike his elaborate little gem, the *Sick Monkey*. We see also Holman Hunt by himself, a flare of red locks washed in with burnt sienna, and a complexion of apparently the same pigment mixed with white, two hands more like flesh than the face, but altogether different in color from it and from each other. Nothing but the large price paid for Mr. Hunt's *Christ* could possibly create any danger that this defiant violation of Nature and sound taste in the name of realism will become popular, or prove more than the most evanescent of insular eccentricities. Another

fantasy does seem popular—a style of which the leading feature is the discharge of all strong shadow from the face and figure, and picking out the sitter as a flat expanse of light and half-shade from a dark background. This chalky system is a refraction from the sunken sun of Pre-Raphaelitism, and will soon follow its source.

Portraiture cannot be said to show an advance for the half or three-quarter century. Lawrence's group of the first three members of the firm of Barings asserts his superiority. Raeburn, his contemporary, is less fortunate in a representative picture, his duke of Gordon having a flayed look. Opie's Hannah More we all know of old from engravings. It does not equal many by Hoppner, of whom those who selected the collection of old works forgot to send a specimen. Nor could they have really thought to show us Reynolds and Gainsborough at their best in the Royal Academy portrait of the former and the latter's duchess of Richmond. Upon the former the artist's unfortunate method of selecting and applying his pigments and vehicles has, with due aid from time, wrought its worst. The picture, never thoroughly finished, is now but a wreck. We know of copies in this country, executed when it was comparatively fresh, which give a much better idea of its primal condition than the original itself as it hangs here the victim of internal decay. As to the Gainsborough, it never was or could have been anything more than a third-rate work. It may illustrate the artist's manner, granting that to be worth illustrating, but there can be no other pretext for its public exhibition. The figure is out of drawing; the colors are crude; the drapery, seemingly dragged in with a garden-rake, would disgrace a schoolboy; the foliage —Gainsborough's trees, too, of which we have heard so much—is too flat and dense for a rifle-ball, much less a bird, to fly through; and, altogether, from five garrets out of six nothing but the name would have rescued it.

Turner and Constable are almost as unfortunate in the examples chosen of them. The details of *Dolbadden Castle* are undistinguishable. *The Lock* is better in that respect, but cannot account for Constable's reputation. One of Fuseli's nightmares, a sketch by Wilkie, and bits of the "high art" of their day by Northcote and Barry conclude the ancients, if we claim for America Stuart's Lansdowne Washington, which ought, if possible, to be kept on this side. Etty and Maclise belong to a later generation. The former speaks through a pink, pulpy and invertebrate nymph, and the latter is very fairly represented by *Macbeth and Banquo's Ghost*. The latter picture is stagey in conception and management, and we look instinctively along the bottom of the frame for the footlights, or at least their reflection in the pool of thick molasses that has supervened from the upsetting of the usurper's goblet. But how can Shakespeare be illustrated without bringing in the boards? He wrote with one eye constantly, and composed often with both feet, upon them. In large and complex subjects from him this difficulty is especially prone to assert itself. Single figures and small groups more easily escape it. We may refer for examples to Miss Starr's *Imogen* among the modern English pictures, a delicate and beautiful creation, and to Amberg's *Ophelia* in one of the German halls, to our mind the best rendering of Ophelia with the pencil we ever saw, just as the Bard of Avon may be imagined to have stumbled upon an original of the character, singing and swinging herself, half unconsciously, half desperately, to death. Neither of these suggests the stage, but sundry *Lears* and *Hamlets* on the walls around us do. A German *Falstaff* gives us a similar interpretation of fat Jack, with a stage wink in his left eye and a *mot* quivering on his lip.

The care of the English committees on selection happily averted from us an inundation of dogs. Animals, so favorite a subject with their painters, might otherwise have driven man from the walls. We should like, however, to have seen more from Landseer in this line. His admirable execution atones for the over-humanizing of his brutes. Ansdell does

not err in that direction. He plumps his sheep and cattle on the canvas as though it were the prize-stall of a cattle-show, fat, smug and stolid, so much first-class mutton and beef. The horses, too, express nothing so vividly as high grooming and unlimited oats. Like Lance's *Peacock* — a familiar work, yellow with oil but still distinguishable in its higher tones of color—they stand quietly to be painted, having nothing else to do. The continental brutes, with less provender

TADEMA'S "VINTAGE FESTIVAL."

and currycomb, show more life and action. Princeteau's horses scared by a railway-train, for instance, could not possibly have come from an English easel. No British artist would think of lifting a horse sidewise in the air clear of his feet. The Frenchman not only conceives it, but does it with perfect ease, spirit and truth.

Landscape is another department that has undergone repression. We find but one of Stanfield's marine pieces. This deals with the short, jerky and conflicting waves characteristic of the Channel, and consequently to a great extent of English sea-pictures, contrasting strongly with the long roll of the flat and open American coast, more familiar to our artists and their critics. They are more difficult to paint, and Stanfield's mastery of them has not been equaled. His pencil tumbles about with the water, but, unlike water, fixes form as it speeds past. At the same time it shoots through the billows with the rays of light, and carries the eye with it. They stand solid, but translucent. The thin layers of superimposed color employed to produce this luminous effect are liable to alteration by time, and Stanfield's work has not escaped this misfortune, the greens having become somewhat turbid.

England's position in landscape is mainly entrusted to the keeping of her unrivaled array of water-color drawings. She has enlarged the capabilities of the process, and shows us here everything it is likely to accomplish. Johnson's *Carrara Mountains* and a carefully-finished drawing of scenery in the Isle of Skye deserve places at the top of the list. Willis's *Cattle* and Linton's *Washing the Beggars' Feet* are as prominent among life-scenes. The heads in the latter are full of character. *The Picture*, by Alma-Tadema, is remarkable for a solidity approaching that of oil. It shares in other respects than technical and mechanical the peculiarities which infect the same artist's performances in oil—his *Vintage Festival*, for example, where the figures might have been borrowed from Etruscan vases if not from an Egyptian sarcophagus. If the highest attainments of the age in the perception of the beautiful are to carry us straight into the tombs of the Tarquins and the Pharaohs, the world has wasted the last four centuries, and all this art-progress is a snare and a delusion.

In historical painting the English school was not supposed to stand high, and there is nothing here to remove that impression. Sir John Gilbert's *Nase-*

by and *First Prince of Wales* fall below the Northcote level. Feeble in conception and grouping, and smudgy in color and handling, they interest one only as samples of the work upon which the honors of British art are at present conferred. And yet we are not sure that in looking round we find anything much better. Prinsep's *La Vendée*, which, though hardly a great picture, we delight in an opportunity

RIVIÈRE'S "CIRCE AND THE COMPANIONS OF ULYSSES."

to mention again; Johnston's *Covenanter's Marriage*, known in many engravings; Stuart Newton's *Abelard;* Elmore's *Leonore*, marked but not vitiated by a novel bronze tone that harmonizes with the unearthly character of the subject; Poynter's *Golden Age* and *Festival*, graceful in design and correct in drawing, and Rivière's *Circe* and *Daniel*,—may be told on the fingers. Both the last-named pictures are distinguished by freshness and originality in viewing the subject. The enchantress is utterly without ornament, and sits on the ground in the simplest possible attire before her enamored pigs—pigs as unmistakably non-English, by the way, as the name of their creator. Long-snouted and razor-backed, they are still common in the country of the sorceress, but would not be suffered to exist in an English farmyard. Their countenances express a human sentiment in a piggish way, and are to that extent more natural than Landseer's dogs, which are but disguised men. It may be objected that Circe's victims are so too, but her transformations would have been incomplete had they not imparted the animal nature with the animal form, leaving but enough of the spark divine to keep alive a consciousness of the degradation.

LEIGHTON'S "EASTERN SLINGER."

Leighton's *Slinger* is a production notable for extreme simplicity in composition, both of color and form. It consists

of a single figure projected in unbroken shadow from a cloudless sky behind. The foreground is a line of level grain, and there is no distance at all. The figure is only a tolerable life-school study in outline, the head being proportionally too small; and the strongest point of the work is its success in preserving harmony between two opposite masses of color without aid from intermediate tints.

British sculpture has little to say for itself. Nothing tells us of the delicate grace of Foley or the power of Chantrey in busts. The latter's West is his only example. The drawings from Westminster and South Kensington speak well for the future of decorative and manufacturing art. Their range is greater than that of the school-exhibits of other countries, and shows more attention to color. All that

WAGNER'S "CHARIOT-RACE."

chromatic science can do to supply defects in the chromatic sense is evidently being done, and if English silks remain inferior to those of Lyons, it will not be for want of systematic effort at remedying the fault. That the etchings from schools, clubs and individual artists are not up to the mark is an observation that might be extended to all the nations and to engraving generally. The bitten plates are scratchy and muddled, and a first-rate line engraving may be sought in vain upon the walls. A mixture of line and mezzotint takes the place of the old process, and that in turn is jostled by a new mode of press reproduction which so far has had the effect of encouraging a hasty, superficial and sketchy style of drawing, tolerable only by reason of the quantity there is of it. From such multiplication of chaff there may result an increment of wheat.

The English ought to cherish engraving. It is the soul of their art. Not only do their pictures as a rule look best when translated by the graver, but many of them are incomprehensible until subjected to that treatment. Turner and Reynolds hardly exist now on canvas. In this respect they differ from the continental schools. We may cite, at haphazard, two pictures, German and French, familiar to us through plates — Wagner's *Chariot Race* and the *Gladiators*. The former is in Memorial-Hall, and its immense superiority to the engravings and lithographs of it is apparent at a glance. The difference in favor of the other is equally if not more striking.

The same causes which give English pictures eloquence to the American eye, with only secondary reference to their technical qualities, will preserve a certain resemblance between the styles of the two countries. When the United States shall have succeeded in building up anything that can be called a school, many of its characteristics will be those traceable in the works just noted. We may hope to escape those desultory and fruitless but perpetually recurring excursions in search of novelty characteristic of the movement of British art, for, though geographically more remote, we are more accessible than our English cousins to the conservative influences of the Continent. Our ideas of color, also, are probably sounder. But in the selection and

treatment of subjects a likeness will prevail, modified of course by the different physical conditions governing in the two countries. Home and forest will furnish the favorite themes of the American painter.

A glance at the walls of the United States section shows how deep we are in the landscape stage. On this broad territory of ours men are in a feeble minority as compared with acres, and the face of Nature is the first countenance to offer itself. The Durands, the Kensetts and the Cropseys had pretty well worked out the fields and rivers of the Atlantic States when Hamilton invented the sea, and Church, Moran, Hill and Bierstadt discovered a new world on the Colorado, the Yellowstone and the Yosemite, five times as gigantic and ten times as wild and lifeless. The pictures, like the literature, of the Plains must have a run. The redwood and the red sandstone of the cañons will gloom and blaze upon our awed optics at least as long as it has taken us to recover from the similarly stunning assaults made upon our literary prepossessions by Messrs. Harte, Clemens and Joaquin Miller. This certainty we accept unmurmuringly, and even gladly, for the phenomena, terrene and atmospheric, of the Plains and the Pacific are entitled to their prophets and interpreters —the more and cleverer the better. What does not seem so clear is the necessity of placing these colossal scenes upon cor-

GIFFORD'S "TIVOLI."

respondingly colossal canvases. Would not smaller dimensions, like those found sufficient for the Alps and the ocean, answer? Is it really impossible to express the immensity of the Great West otherwise than in feet and inches, and is it necessary to enlarge on a scale in proportion to the difference in altitude to show that the Nevada towers above the Alleghanies? The original studies must have been of the size of a portfolio or thereabouts, and an effect compatible with that degree of compression would hardly have suffered under a more moderate enlargement than that of the completed painting. However, acreage is of but minor importance in pictures or in farms. It is cultivation that tells, be the ground broad or narrow. We may scan with equal eye the Rocky Mountains under a pane of glass in the show of the American Society of Water-Colors or expanded from the palette over one side of a main hall.

One of the most successful captures by these Western hunters after cloud-effects is Hill's *Donner Lake*. A wisp of fog is caught flying in the middle distance, the foreground bright and the horizon only partially intercepted. A portion of the beautiful tarn stands out clear, and we are left to people the veiled part of its shores with imagined life enough to redeem the idea of desolation so much at war with a scene of such luxuriance. Bierstadt's *California Spring* does not encounter this difficulty. Pastoral appli-

ances are there in due abundance, and we do not feel that the carpet of sward and flowers is, as concerns its use to man, thrown away. The charm does not provoke us, as in a geologic restoration, with a sense of idle waste. Church's *Chimborazo* beckons us down the Pacific coast with a confidence based on an assured reputation, but we venture the criticism that the purples of the distance are too raw, and that relief and atmosphere are neither quite what they should be. M. F. H. de Haas's *Brig Hove to for a Pilot* and Hamilton's *Mid-Ocean* may stand for many palpable evidences around us of the mastery of the waves by American painters. The latter is a bold design, admirably managed. The billows, without a trace of man, are company for themselves, replete with impulse and action, and exclude all impression of solitude. The concentration of all the sunlight, or rather cloud-light, into one point in the middle of the picture leaves the horizon to broaden illimitably into nothing but sea and sky.

Hart's *Summer Memories of Berkshire* is an opposite treatment of sunshine. It is sifted through thin banks of clouds over a tranquil New England landscape. All is in a low key, drowsing to the hum of noon. Gifford bathes *Tivoli* in a haze of a richer hue, translucent Italian gold. Success in exceptional aërial effects is characteristic of American landscape-painters. They have, we think, nothing to ask from Turner. His fantasies in cloudland lack the finish and precision needed to make them true and admissible. We may very well concede that he actually saw most of what he sketched, but it remains a sketch only, hard, opaque and vague, unsatisfactory for want of the elaboration which would compel our prompt acceptance of an effect of light and form too novel to reconcile us to its truth without our being additionally assured of its probability. He reminds us constantly of the Spanish saying, that the true is more improbable than the false, and he assumes the responsibility of correcting that defect. His habitual failure adequately to meet that responsibility is notorious. His labyrinthine skies and distances we fail to traverse, led even by the hand of his devotee Ruskin. Through the serene and equally poetic depths of Gifford, Hamilton and De Haas we move without the need of a guide.

Our American autumn is singularly slighted in the Centennial collection. Lawrie's *Autumn in the Hudson Highlands* is one of the few visible attempts at reproducing our woodland kaleidoscope, and it has little merit beyond being the best of that few. In nothing is the incompleteness of the United States exhibit more strikingly illustrated. That incompleteness, we may here say—and extend the remark to all the countries—is not an unmixed misfortune. To get a true idea of the state of art the absence of the best pictures is better than that of all the worst. A thorough weeding out of the mediocre and inferior would destroy the average and prevent our judging the condition of public taste. Better that, excluding the very lowest, some liberality be exerted in admitting the rest. There is, moreover, always some difficulty in deciding upon the best. Artists, connoisseurs and mixed committees have an infinite variety of predilections among themselves, and rarely will two individuals agree as to the merits of a given work. That class of pictures which all of them unite in saying, in a half pooh-pooh way, "will do," may be safely accepted, and will always be in one or another way instructive to the layman or general observer. France did not send the works of her best painters, but we can form very safe conclusions as to the peculiarities and tendencies of the French school from what she did show. Germany, we are given to understand, pursued the contrary course of careful winnowing, and as a result our chief regret is that it was not more careful still, for we cannot suppose that what we see is the cream of her studios. Taking her at her own word, she has nothing better behind, whereas we know that France has. We study the French average with a confidence the German choice fails to inspire.

In heads our artists of the day have little progress whereon to plume them-

selves. Stuart, Sully, Neagle and Inman stand on as yet unshaken pedestals. We may rank, too, with those lights of the past the late S. F. B. Morse of telegraph fame. A female head by him is not unworthy of mention in the same line with one that stands as almost the sole representative of Sully's pencil. The Historical Department derives its only illumination from two or three of Stuart's heads. It should, by the way, have been strictly segregated to a nook exclusively its own, where it could have rested on its proper basis of association, and not of art. Memorial Hall is a natural repository for the mementos which compose it, but not those parts of the structure devoted to art *per se*, with no reference to the special office of elucidating the past.

It is remarkable that some of the heads most distinguished by boldness of touch should come from female artists. Several contributed by Miss A. M. Lea of Philadelphia would be singled out for their strong impasto and peculiar yet effective method of coloring. Another, by Rosa Schweninger, in the Austrian galleries, is also bold and vigorous in style to an unusual degree. The *Patrician Mother* and the *Neapolitan* would have looked particularly out of place among the feminine handiwork of the Women's Building. A majority of the studies amid which they hang might have been transferred to that part of the grounds with less danger of suspicion as masculine intruders.

For such models as the Europeans seek in the Levant, Algeria and Southern Italy our artists have poor substitutes in those Western Orientals, the red man and the black man. The Indian's drapery of skins and army blankets is of but slender capabilities for the picturesque, and his features are anything but classic. Those of the negro are still more defective in regularity, and his dress, copied from that of the white, wants even the grace of hides and feathers. These two subjects appear to have been pretty well exhausted and abandoned. The Indian since the days of Catlin, with a slight renaissance under Carl Bodmer, has been tacitly turned over to the photographer, and the black can be made available only after the style of caricature. The artist who makes a specialty of him must accept the position of a humorist. Undeterred by that reflection, Mr. Eastman Johnson unbends, and with excellent results. His negro groups are highly graph-

PORTRAIT OF A LADY, BY MISS LEA.

ic; fortunately, for they have the field almost entirely to themselves, and five millions of American freemen would otherwise have been unrepresented. In what is habitually termed high art it cannot be said that American soil discloses the footprints of a coming man. Somewhere within these six or eight hundred frames his sign-manual may lurk, but if so he has hidden it effectually. But can we not get on without high art? How many of us know it when we see it? Is there any warm and wide aspiration among us for the advent of its prophet? When that demand shall manifest itself, its gratification will hardly be far off.

If we pass over foreign ground and hunt for him with a German lantern, the probability of finding him does not seem much more brilliant. He is certainly not the author of *Columbus discovering America*, an ambitious attempt at a subject never yet respectably rendered, nor of either of two pictures of the Sedan surrender, which could have been admitted into a friendly reunion of the peo-

ples only from a desire to put the French in good humor by satisfying them that their foes, however adroit at winning victory, make a poor fist at celebrating it; nor in the life-size equestrian portrait of the Crown-prince, anchylosis triumphant in the anatomy of horse and man; nor even in the Teniers-like groups, better far than any of the "stunners" we have cited, of Herren Ottlieb and Geibel, minutely studied and half Anglo-Saxon in humor. We must seek the art-successes of Germany on a rather lower level, if landscape-painters will allow us so to locate Achenbach's *Vlissingen* and Heck's *Natural Bridge at Capri*. The former is a *tour de force* in effect, the latter in color—both fine in their way. They are accompanied by many less notable but fair bits of land and water, and subjects

EASTMAN JOHNSON'S "OLD KENTUCKY HOME."

difficult to classify and as miscellaneous as those occupying the American walls, German art, like ours, being still rather undecided as to its vocation. Kaulbach is dead, and Düsseldorf nearly extinct. Genre and the classic are left leaderless, to stare confusedly at each other across the field. In *Neptune's Travels through the Sea*, O. von Boven stumps through mythology on the crutches of Guido, that highly-colored work being an adaptation of the *Aurora*. Von Boven's is not a solitary example of this kind of borrowing, adaptations, much more palpable, of Titian's Ganymede being conspicuous, for both position and size, in the English and French sections.

Germany shines more in lithography, porcelain-painting and engraving than in the higher provinces of art. The chromos of Zettler from Munich, Ens & Greiner's enamels, Duncker's plates, and the carbons of the Berlin Photographic Company fill a very attractive corner. Water-colors appear to be less popular with the Germans than in America and England.

Southern Germany presents us with a touch simultaneously of tropical coloring and Northern thrift. The well-arranged halls of Austria glow with strong tints, to which the carefully-priced catalogue adds the golden hue of barter and sale. Small harm, however; her pictures were sold at the round prices affixed. The artists of the dual empire did not slur their work, and deserve a corresponding compensation. No price was affixed to Makart's large painting, *Venice paying Homage to Caterina Cornaro*. An American purchaser was not likely to be found for it in any case, its merits not being commanding enough to overcome the remoteness of the subject. The technical qualities of the picture are not such as to explain the prominence it assumes. Smaller works around it excel it in design and composition, and some single studies, which afford little room for composition, are, as usual, the most satisfactory. *A Jurisconsult* by Amerling is full of quiet, strong simplicity. Von Berres's *Cattle-Dealer* suggests the influence of Rembrandt in everything but

the flesh, which is chalky. Fux's *Sans Souci* is a fine rough study, boldly laid in and not risked in effect by over-finish. In Felix's *Pan and Bacchantes* we have some good figure-drawing, but the spirit of the old superstitions is better caught

MAKART'S "VENICE PAYING HOMAGE TO CATERINA CORNARO."

by Swoboda in *The Bottom of the Sea*, a charming fairy scene bathed in the golden glow of sunlight striking through the waves and finished as exquisitely as Landseer's *Bottom and Titania*. The landscapes are not what might have been expected from the country of the Tyrolese. The distances are generally too much sacrificed to the foreground, form, as expressed in rocks, trees and architecture, being a controlling point with the artists. A moonlight scene by Van Haanen is among those which best meet Cisatlantic theories of the proper management of aërial perspective.

An art-revival is said to manifest itself in a new architectural departure in the modern erections of Vienna. We cannot trace any very novel traits in the paintings contributed by that capital, but their effect in mass is certainly rich, and the execution of most of them is painstaking and earnest to a degree that indicates anything but stagnation in art.

No contrast can be more decided than that between the Austrian frontispiece and that of the French. France has many large pictures, and no one of them exactly so placed as to command from conspicuousness distinction from the rest. But there is one so peculiar in subject and treatment as to have earned notice above all the others, and to have been popularly singled out as typical of modern French art. This is Becker's *Rizpah*. A woman of more than heroic size stands in front of a gibbet that bears her two sons and their five companions, and,

BECKER'S "RIZPAH PROTECTING THE BODIES OF HER SONS FROM BIRDS OF PREY."

brandishing a stick with immense display of physical effort and anatomy,

keeps at bay a vulture. That constitutes the whole motive, and we need not say it is unsatisfying, not to say pictorially trivial. Nothing but exceptional force in the accessories could make it appear otherwise. The necessity of supplying this, and so turning to dramatic and emotional effect the act of driving away a timid and harmless bird, is fully recognized by the artist. The suspended bodies are true to a sinew; the drapery and pose of their high-tragedy dam, a Jewess of Jael-like type, are all that could be wished: the chiaroscuro is what effect demands; and the whole is overspread with a livid tone in keeping with the scene. Add to this that all positive colors are discarded, and we have a production we find it unfortunately too easy, although unjust, to accept as illustrative of the prevalent French style. So far as concerns the sacrifice of color to design, and the present fancy of a certain number of leading French painters for revolting subjects, we might so take it. It is true, as the collection before us proves, that their command of form has made the French somewhat contemptuous of the secondary adjunct of color, and that a tendency to monochrome is discernible in the predominance of grays. Prion's *Young Satyr*, for instance, one of the most vivid, telling and masterly compositions in the French halls, has nothing higher in color than a medium green, the prevalent shadows being a cold olive. In Perrault's *Bather*, the loveliest and most correctly modeled female figure in the building, the flesh-tones are also cold. And in the dead or dying Cæsars — why not, once for all, grant "great Cæsar dead and turned to clay," and cease stabbing him with the pencil?—of MM. Yvon and Clément nothing rises above half-tint except the red, which emphasizes blood and harshly sounds the keynote of the theme. These two works are imitations of Gérôme's well-known representation of the same event, and his avoidance of warm color is constant, whatever the character of his subject.

That the French, nevertheless, know how to use color, and are not afraid of it when they think proper to bring it to the front with their other forces, no considerable area of their walls is without proof to show. Here is *Echo*, a female figure nearly opposite Perrault's, warm with a broad Titianesque glow; Petit's flowers, brilliant without crudity; Rosier's *Morning on the Lagoon*, a solitary boat swimming in incandescent mist; De Coninck's *Pastorella;* and *The Rest*, by Perrault, the silver side of whose genius, cited above, here turns to bright gold in a peasant-girl asleep upon a sheaf of grain, the carmine of her complexion and warm brown of her hair brought close against the yellow straw without the least conflict, all uniting in a mass of light and color not to be outshone by Reynolds or Etty. Schenck likewise proves his command of opposite tones in his companion pictures of sheep, one bevy crowning a knoll of purple heath, and the other dragging their "golden fleece" through a snowstorm. And Clément's blank and livid assassination-scene has its dreariness enhanced by having for foil as brilliant a bit of still-life as Lance ever turned out. Another frolic of color in a similar subject was employed in the same way by the hanging committee to set off a work done in a hard, white mosaic style by Morin.

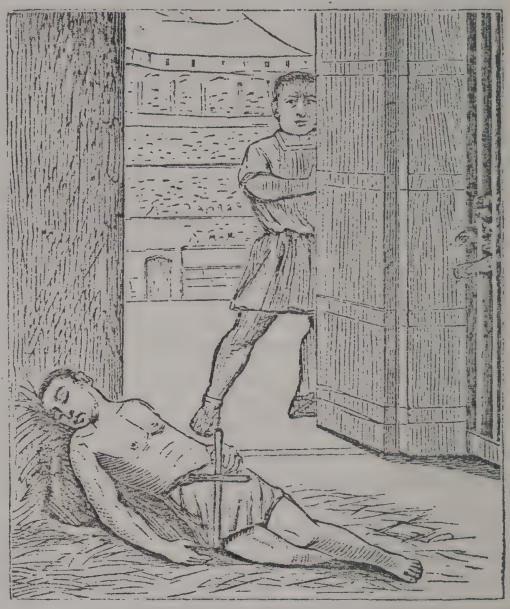
Had Duran's big portrait of a horse and lady been painted the size of a handkerchief, and not that of a very large barn-door, it would have been but little discussed. It is well drawn, except that Mademoiselle Croizette has no visible means of support in the stirrup and saddle, and the spectator has to press into service his faith and imagination to aid in sustaining her. The drawing and the grace and sweetness of the head are about the sole merits of the work, for its defiance of the requirements of chiaroscuro in making the riding-habit a flat dead mass of black—"nothing," as artists say—and cutting out the horse from the light background with a dark outline at all points, tend to remove it as a whole from the pictorial category.

Those who have formed the impression that French art is generally sensational will modify it after inspection of the present display. The artistic, like the polit-

ical and industrial, life of the nation breaks out into theatricals only at intervals, and is, with such sporadic exceptions, remarkably plodding, practical and thorough. The superficial and flashy do not at all characterize it. Subdued color and careful design we have seen to prevail. Boldness in selection and development of subject is not only quite compatible with those traits, but to some extent consequent upon them, as being naturally inspired and justified by knowledge, self-confidence and self-control. Intense realism we find, accordingly, to combine in the works of the leading French painters of to-day with novelty of conception. Among their contemporaries of some other nations it is more usually combined with thinness of idea and slovenliness of execution, the ability to build up some prominent feature of a picture with a certain hard and staring precision being complacently assumed as conferring a license to slur all the rest of it. That is not Nature's way. The French follow Nature.

None of the classicists have produced anything much more cool, quiet and scholastic than Laforte's *Young Bride*, or handled a dramatic theme in a less melodramatic yet effective method than Reichert's *Blinding of Arthur*. We know no English illustration of the latter scene so little violent and overstrained. At the same time the story is told clearly. The conflict of duty and pity in Hubert is admirably expressed.

In landscape the French err on the side of repose and reserve. They play no tricks with their clouds, and make little use of "accidents" in the distribution of light and shade on the land. Their skies are not luminous, and their seas wear a uniform of brown and gray. Their pencil seems to grope about over such broad masses for some object to take hold of, never feeling quite at home without the support of form. The French artist accepts chiaroscuro as an accessory. Making it a principal motive, in the manner of Danby, Martin, Wilson and Achenbach, is what he does not understand. The difference is something like that between Claude and Salvator Rosa.



SLINGENEYER'S "CHRISTIAN MARTYR."

Frith's collection of clothes and clean pink faces in the *Marriage of the Prince of Wales* finds a counterpart, in many points, in Viger's microscopic achievement of silk and lace, *Josephine in* 1814. The fashions of the first Napoleonic era have stood the fire of time and taste better than those of fifty years later will have done fifty years hence. Marshal MacMahon in bronze, with his close-fitting surtout and his long Irish limbs encased in cylindrical trousers, additionally exemplifies the troubles imposed on art by the prevailing costume. The great of our day will be handed down to posterity heavily handicapped with a raiment of right lines and mathematical curves. How they must envy the ancients their drapery or absence of drapery! The mode did not change then in many centuries. The figure, undraped or in outline, was as familiar a sight as the face and hands. Men remained the same,

to the eyes of each other and of the artists who perpetuated their images, through generations. Now, the human body has been steadily disappearing since feudal times, the date of a portrait, carven or painted, being assignable within a decade or two by the dress, the sartorial shears chronologically slicing up the moderns into as many distinct races. It is becoming extinct as a daily familiar study to the draughtsman and modeler, to say nothing of their crowd of critics, who are shocked by the innocent exposure of it. As it is the summit of beauty and the foundation of design, its fading into a tradition must seriously affect the art of the future. Were all that we possess of the antique to be suddenly swept out of existence, we should not be long in realizing the blow dealt at æsthetic culture by the tailor and the milliner. The sculptor of Trajan's column contemptuously put his barbarians of the North into ruffled pantaloons, and the Pompeian mosaics present us the Persian in a stovepipe hat.

It was a very mild type of Pre-Raphaelitism that afflicted France, and it rapidly passed off. The curious may trace it in Sainton's *Solitary*. Life is too short and art too long for so practical a race to throw away an epoch in harking back on a scent so cold and misleading.

None of the other nations sustain pretensions to a school of their own. Russia, heretofore classed as purely imitative in art as in other things, may hold herself an exception. Certainly she astonishes here, as she does elsewhere in the exposition. Her peculiar society and modes of life, so far removed from Western observation and influence, provide a variety of new subjects and methods. The exceeding cleverness of her genre bronzes we have elsewhere noted. In her pictures we see strong color and the predominance of an Oriental rather than a Northern spirit. It is evident that this practically new race of seventy millions is going to be a reinforcement to Western culture, and not a clog upon it.

Belgium and Holland make each, the former especially, a large display, but it is not easy to find much that is distinctive in merit and style. The largest and most ambitious in the Belgian exhibit are, as usual, not the best. De Loos's *Rebecca* is a piece of sweet coloring, and Slingeneyer's *Martyr* is vivid as a narrative, and marked by some passages of light from separate sources that are well managed. Wittkamp in *Parisina*, and Stallaert in *The Cellar of Diomed*, grapple successfully with other striking light-effects of the tableau or red-fire order, local color showing well through the illumination. These plays of secondary light seem to be popular with the Belgian artists—a reminiscence of the old Flemish fancy for village conflagrations and nocturnal groups around braziers. Tschoggeny paints a stable on fire, with a white horse starting back from the flames, the red light overspreading his head and shoulders. In such episodes of tangible and familiar life there is better success, and success is better worth gaining, than in the spectral horrors of Wiertz, which the Belgian government deemed worthy of being photographed for the edification of our artists. In sculpture and faïence a similar level to that in painting is preserved. Fraikin's group in marble, two female busts by Fassin, and Bouré's bronze lions are worthy of note. Some examples in forged iron, in imitation of the Flemish renaissance and the period before, are very acceptable from the country of Matsys, the Antwerp blacksmith.

To the Netherlands we are under obligations for Altmann's copies of works by Vanderhelst, Rembrandt, Paul Potter and Frank Hals. Traditions of those masters and their contemporaries are manifest rather in the selection than in the treatment of subjects by modern Dutch painters. Animals, interiors and landscapes make up a large proportion of the paintings exhibited. The old finish and the old feeling do not appear. The best of the marine views is credited to H. Koekkoek, Jr., of London. It shows English influence. Hanrath's *Peddler* is a strongly-individualized head.

In the feature of earning a strong national imprint by the faithful portraiture of the land and its people the Dutch

section resembles that of Norway. A long and hard winter, a sombre sky, dense forests, a coast of cliffs eaten into saw-teeth by the sea, and a season of outdoor life intensified by its shortness, may be traced on the walls of the Norwegian section. Askevold paints for us a cluster of cattle at a mountain-tarn, minute and exact as if photographed, and much more vivid and natural. Norman plunges us into the Romsdalsfjord, and Skari points us westward to a fleet of fishermen. Nicolaysen reproduces an inland lake in its rich purple drapery of mist and heath. Human life is quite a secondary element in the mass of wild scenery. One of the half dozen pictures illustrating it gives us a curious view of society and religion in a *Fight at a Christmas Feast*. The spirit of the Ber-

VALLÉS'S "MADNESS OF DOÑA JUANA."

serkers is not dead, but sleepeth. Their descendants draw the barren ancestral hills with a loving pencil, but look beyond them for a career.

Swedish pictures, like the country, are more densely peopled. Habits and habitations come to the front. We "assist" at a peasant wedding, where the bride blushes under a golden crown, and witness, uninvited this time, the sensations of another damsel, as yet a bride only in expectancy, as she opens a letter. Subjects are sought, too, by Swedish art-students in the less meagre life of the Rhine and the Tiber. Hafström picks up at Düsseldorf an incident from the late Franco-German war; Ankarkrona sends two admirable sketches of the desert from Africa; and Malmström bears us back to Norland to witness a *Dance of Elves*—a troop of fairies rising with the mist, into which the more distant of them fade. The establishment of a leading school of art in Stockholm is of course not among the probabilities. That the art of so isolated a region should escape being overlaid by oddity and affectation is as much as we could hope, and the exhibit in Memorial Hall proves it to do more.

On Spanish art we naturally build larger calculations, and they are correspondingly difficult of fulfillment. Perhaps the revolt of a Northern eye from the yellow coloring of the Peninsular pictures prevents a fair appreciation of them. This difficulty meets us at the threshold in a large picture of the *Landing of Columbus*, a blaze of crude color. In Gonsalvo's interiors of churches, where all is subdued into an infinity of deep brown shadows, we find relief. Grateful too is the olive tone of Gisbert's *Landing of the Puritans*, the best rendering of that subject with which we are acquainted. In a *Roman Conclave*, by Jover, a mass of scarlet drapery fails to run away with the artist, and is subdued into richness

and harmony with the adjacent tints. Vallés's *Madness of Doña Juana* is a fine theme finely studied. We see none of the violence we are accustomed to in the treatment of insanity. An atmosphere of dreary hopelessness seems to pervade the mass of gray tones which relieve the chief figure. *The Burial of St. Lawrence*, by Vera, is another elevated conception profoundly treated. The background is rather flat, but the admirable drapery in front has thence the more value. Both these groups might be transferred to marble with little loss of force. Velasquez and Murillo are shown in a portrait by one and a *Crucifixion* by the other; but they are not choice specimens, although illustrative of the manner of those masters.

VERA'S "BURIAL OF ST. LAWRENCE."

In art, as in other things, "blood will tell." A certain resemblance in style obtains between the two Peninsular states and their American progeny. A common taste for religious subjects is also apparent, though more marked in the mother-countries than in the colonies. Unprogressive Mexico has changed least in the latter feature, while the "live" republic of the Plata almost turns her back on altar-pieces to paint the Gauchos and their herds, which is done with no little spirit and character. The Mexican contributions number seventy or eighty, some of them large, and make a considerable display. *St. Charles* by Pina has merit enough in execution to make it noticeable anywhere. Two studies of the nude, a boy fishing and the *Young Artist*, are unexceptionable in drawing and modeling, with warm and clear flesh. Among the portraits of Mexican celebrities, that of Juarez, the Indian president, and one of the best rulers the republic has had, is most interesting.

Brazil rests her claims chiefly on some enormous battle-pieces, lurid and disagreeable, and looking as if they might be true to the reality of the combats and their stage. In this species of pictorial triumph she is joined by her allies, the Argentines, until the spectator forgets that the whole pother was over the conquest of little Paraguay, a more than half-Indian community of a few hundred thousand souls. *The First Mass in Brazil* excels these in promise of an art-future for the great southern empire.

A past which has done its work and fixed its fame is pleasanter to contemplate in its most fragmentary remains than a future yet to come, if it comes at all. It were to be wished that the old countries had sent to the exposition more of their treasures of ancient art. They would have been a most acceptable sight to this brand-new Western world, and would have helped to mellow the rawness of a display freshly minted and rejoicing in its new glitter. It is wholesome for us to be taught that some fields do not acknowledge progress, and that the most boastful of the ages may find things to envy and imitate in the ashes under its feet. American appreciation of classic sculpture has had to subsist on a thin diet of plaster. Casts are a poor interpretation. Of other remains we have been able to gain a still less satisfactory idea. But these objects are not very movable, and their possessors are naturally cautious of allowing them to be moved.

The Castellani collection was therefore an especially welcome exhibit. The objects composing it are undoubtedly genuine, and many of them of a high class. The gems, busts and statues include some of the best Greek period. A Cupid and Psyche are attributed to the school of Praxiteles. A Perseus and an Apollo may rank with that group. In better condition, and of more assignable date, are—a boy extracting a thorn, a favorite Roman subject; a fine profile of Tiberius; two female portrait-busts of the Empire; another catalogued as Sappho, and a number of others, each in some way distinct. Their more or less mutilated condition records the ancient revolutions in religion and politics, a long succession of image-breakers having wrought their spite on the senseless marble. But most of them are in better plight than were the Medicean and Belvedere statues when first discovered, and hardly one is so much of a ruin as the famous Torso. The best preserved is an Indian Bacchus, characterized by the bearded Oriental face and the Lydian drapery with its rippling folds.

We see, besides, a medley of articles of personal adornment from the time of the Pelasgi down, all curious and some instructive, and vases, lamps, etc. in metal and terra-cotta, illustrating a wide range of taste and attainment. To the strictly ancient collection are added some majolicas of the fifteenth and sixteenth centuries. The earliest, of the Urbino school, struck our eye, untrained in ceramics, as being the finest. More curious perhaps is the Gubbio ware of 1520–40, with its iridescent glaze. The designs are ascribed to leading artists of the day, but they are certainly not their best work, having been probably dashed off like the chalk and sepia sketches we have from those hands.

Whatever Memorial Hall may hereafter become, it could not in its centennial stage be termed a museum of applied art. That character belonged more truly to a majority of the other structures of the exhibition. Illustrative and creative art declined an alliance with decorative and useful, and crowded it bodily out of these granite portals. Room was made for a few stained glass windows, but

INDIAN BACCHUS.

those gay defiances of the command "let there be light" carried their rainbow hues to more congenial retreats. France devoted a building to them. Munich and Italy also competed for eminence in what exacting amateurs call a lost art. The exile of stained windows was shared by the photograph. The connoisseurs of the camera probably concluded, after a tour through the large building assigned it, that the smoothest large photographs, made without "throwing up," were Russian; that Sarony of New York succeeds in imparting something of an artistic effect to his lights and shades; and that Bedford, Lemere & Co. of London manage to catch an unusual amount of atmosphere in their landscapes.

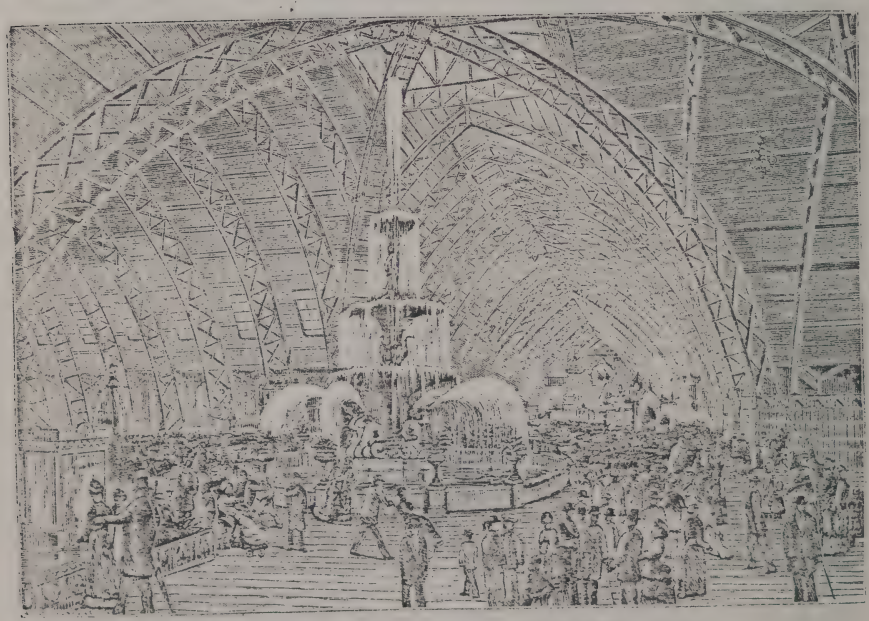
One thing to be said in favor of the knights of the lens may afford a hint to artists. This is, that they work, as their machine obliges them to work, on the actual objects around them. Unable to combine or modify, they can only select and copy. In excluding the imagina-

tive they are saved at least from the fantastic, the hasty and the inaccurate. Photographers, in making what in this way they can with their process out of the materials at hand, point the path for artists to similarly employ their own method in grappling with the subjects and objects of the day—design first with the utmost care, and then employ their higher faculties in giving the result a soul the camera can never impart. They have better landscapes to study than Both and Ruysdael had, and more spiritual Madonnas than the Fornarina. There is but one school of Nature, and he who honestly follows that will not fall into the affected or conventional, and will not concern himself with inventing a manner of his own. Style will come of itself, born of subtle influences of race, circumstance and idiosyncrasy; for no two men see with the same eye or the same brain behind it, and the hands of no two work under identical conditions. The artist individually should ignore it, and confine his efforts to what he can attain of precision and truth. He will not then run after tricks of effect or take short cuts in pursuit of the picturesque.

So far as art is dependent for its elevation on patronage, the question seems settled. The social position of the artist never was higher. The civilized world is three or four times more populous than in the sixteenth century, and a great deal richer. Taste is more generally diffused, and so is the means of gratifying it. Here were two or three thousand modern pictures and statues collected under one roof. They were but a fraction of the whole, and not the best. The prices attached to them would have startled the most courted master of the Cinquecento. The crowds of this utilitarian day and country forsook the engines and their fabrics to press into Memorial Hall, and jostled each other in the only edifice on the ground where the demands of space for both sights and seers were underestimated by the architect. Nor did the visitors all rush to any one work. No central shrine monopolized their worship. They found something everywhere to appreciate and admire. A craving for the beautiful is evidently a popular trait, and in advance of the provision made for its satisfaction. Clearly, art commands its own future.

PART XI.

AGRICULTURE AND HORTICULTURE.



GENERAL VIEW OF INTERIOR OF AGRICULTURAL HALL.

THE farmer's assumption that everything comes from the soil would have required the assignment of Agricultural Hall to the place of honor in our series of sketches, in precedence of its more prominent associates. We are sustained in the arrangement adopted by the action of the Commission in placing the engineer, the craftsman and the artist in front of the line, and billeting the tiller

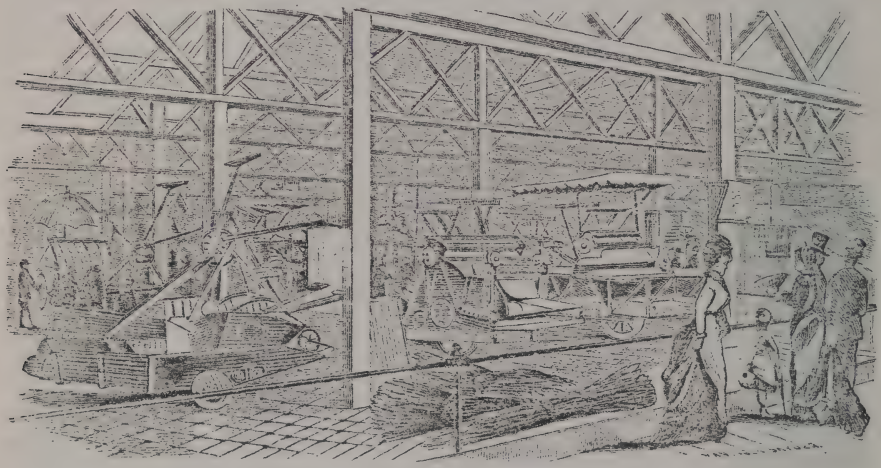
of the earth in a secluded corner of the grounds, "by wealth of woods embraced." Here, as in actual life, he had to be sought out after quite an expedition from the busy centres of art and industry. The difference was, that we did not find him in work-day garb, his plough polished only by contact with the furrow and his crops in the homely clothing of sackcloth they wear to market. Far from it: his Gothic granary was as neat and well ordered as it was fit and capacious, his implements were all that varnish and plating could make them, and the fruits of his toil were tricked out like confections. It was clear that he had attitudinized with much care and patience before presenting himself for universal inspection, and it was pleasant to see the most ancient of callings look so fresh and young.

In fact, it is young: it cannot afford to be old. It has too many millions to feed —more than ever before, and increasing at a rapid rate. And their draft upon it is for a superior and more varied as well as a more lavish supply. Such a food-supply as that which formerly served for the masses will no longer answer. Pulse and black bread, with occasional cider or weak ale, is a dietary to which they continue to be restricted only in very rare instances. Better bread, a longer list of vegetables and more frequent meat, with tea, coffee and other new-fangled fluids, are consumed instead. Clothing, too, of wool and vegetable fibre must be produced by the cultivator in abundance unknown in the old days of homespun and leather. The daily ration of the average man doubtless remains what it was originally—say, three per cent. of his weight —but it is more choice and varied in its components. His raiment has not only changed in that direction, but it has become much more ample and costly. The victualing and clothing of mankind have grown to be one of the learned professions most truly deserving the name. The science of the jurist has not very markedly advanced since the birth of the Common Law, and scarce three generations have elapsed since Galen was still a guide to our physicians. But scientific agriculture is a product of the century, and thus had a special claim to distinction at the present celebration. The Sinclairs and Arthur Youngs — to say nothing of the Cokes, Liebigs and Johnstons—fall within the hundred years.

INTERIOR OF A SECTION OF AGRICULTURAL HALL.

Within that period it has built up a copious literature, appropriated a large province of chemistry, so improved the breeds of domestic animals as to make them rather new species, and in still greater measure widened the range of useful vegetation. Under this roof it collected a machinery department, a manufacturing department, and we had almost said an art department of its own. Cheese is not so elegant a fabric as silk, but its origin is more respectable, its preparation for use almost as much of an art and mystery, and it gleams much more magnificently before the American eye when seen in the list of exports, where it represents a little less than fourteen millions of dollars annually. The cow sends forth the golden mintage through factories planned, fitted and managed with as many finical niceties of temperature, calculation and process as intervene between the mulberry-leaf and the milliner.

How constantly the methods and appliances of natural science are brought to the assistance of the agriculturist is familiar to all. Wool is sorted, the diseases of organic tissues traced, and many other like offices performed by the microscope. Chemical analysis determines the wants of soils, the value of fertilizers, the



MACHINERY SECTION, AGRICULTURAL HALL.

modes of perfecting sugars, wines, etc. Geology has been making itself useful of late, in addition to its other employments in this connection, by bringing to light mineral beds rich in potash, phosphates and other guarantees of fertility lacking on the surface. As it brought coal to replace the exhausted forests, so it calls the under-world again to the rescue of the outer crust depleted by thousands of harvests.

Agriculture might claim for its department, in addition to the array of labor-saving contrivances which occupy so large a space in this building, much machinery employed upon its products and exhibited elsewhere. Those upon the spot, however, are material for volumes of description and remark. In finding ourselves thus surrounded by acres of portable steam-engines, threshers, reapers, mowers, churns, automatic fruit-dryers, coffee-hullers, wine-making apparatus, forges, tile-kilns, steel ploughs that are embodied solutions of abstruse problems in applied mathematics, and many other applications of a minimum of means to a maximum of results, we wonder how a vocation so complicated and profound can ever be thoroughly mastered, and at once strip the word "rustic" of its old associations with ignorance or simplicity.

Yet the exhibit of machinery was very

incomplete, the nation most advanced in scientific agriculture having unfortunately made little or no show. A year before, the British makers of implements had resolved to abstain from competition here, the chief reason assigned for so singular a course being the apprehension that their inventions would be pirated by American rivals! As the indebtedness, so far, is notoriously the other way, we are unable to accept this as the true explanation. Whatever the cause, England, so strong and attractive in other divisions of the exposition, was in this one conspicuous by her absence. Her efforts may be summarized as fancy biscuits, pickles and malt whisky, with a modest garnish of hoes and pitchforks. We must not forget to add wire-netting for sheep-folds and similar purposes, well made and at a very low price.

Canada took upon her shoulders the cause of the mother-country, and fought her battle well. She filled at the same time, it must be said, the place of the bat in the conflict of bird and beast. The character of her contributions reflected United States influence quite as decidedly as British. Agriculturally, her provincial allegiance is about equally divided. Her ploughs are after the American pattern, with an approximation to that of the old country only in length of beam and handle. So with her reaping- and threshing-machines. She surpasses England, and bids United States growers pause, by her specimens of wool of the two extreme grades typified by the Merino and the Leicester. Her "canned goods," in which she figures largely, are got up in a style adapted to the British taste. Among the viands thus embalmed were noticeable some familiar to us only through English literature—mutton-pie, for instance. With the proclamation emblazoned on tin of "Every man his own pieman!" must begin the disappearance of a character classic from the days of Simple Simon to those of Punch.

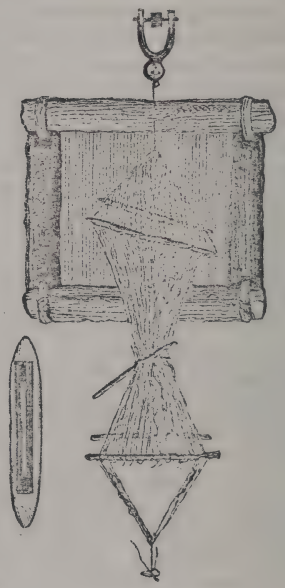
Much more attractive to some observers was another class of animal preparations from the same semi-arctic source. The natural history of Canada was illustrated by collections of stuffed quadrupeds and cabinets of insects, the latter more carefully arranged and labeled than we usually find them.

From the more distant British colonies there was nothing to match their brilliant display in the Main Building. A reaper from South Australia spoke but indifferently for the condition of the mechanic arts in that part of the antipodes. So much the better for our manufacturers: they may find an outlet there for their productions of this kind, as they have already secured one for their axes and similar tools. They should indeed compete successfully with the English for the trade of the tropics and the southern hemisphere generally, so much lighter is their work, at the same time that it is at least equal in efficiency and durability. The inability of most of those countries to supply themselves with these requisites of what will always be their principal industry was made apparent enough by their respective exhibits here. The few implements visible among the rich and teeming productions they cultivate were rude and clumsy. The sugar-mills of Cuba, Brazil and the Spanish Main procure their costly and complicated outfit from Europe and the United States, but the ploughs, hoes and machetes which keep them supplied with pabulum are mostly of native origin, and as rugged combinations of wood and iron as one would care to see. That such laborers with such tools should produce such a surplus for the comfort and enjoyment of the peoples of the temperate zone is eloquent of what Nature has done for the equatorial belt. Brazil, so ambitious in all her industrial demonstrations at the exhibition, leads her tropical sisters in this item as in many others. Her implements are more noticeable than theirs, but still cut a very insignificant figure in the contents of her pavilion of agriculture. Its columns, densely festooned with cotton and wool, both which somewhat incongruous exports she sends largely across the Line, still did not express her chief contribution to commerce—coffee—or many minor ones, such as hides, dye and ornamental woods, tobacco, India-rubber and medicinal plants.

These were set forth on long and well-ordered benches, making up a spectacle to our mind better worth study than what she has placed in either of the three other halls.

Venezuela, which joins Brazil in cheering our matutinal meal, was not more backward than her southern neighbor in proving her power to do more substantial things than filling our coffee-cup. Her exhibit of ornamental and useful timber was accompanied with the leaves, and often the fruit and flower, of each species, so as to make it an instructive herbarium. Cacao, of course, from the tree to the finished paste, was prominent, and there were added roots, medicinal and nutritious, and staples less distinctive of the country. The spirited efforts made by the South American states to be adequately represented at the Centennial, and the remarkable merit of their display, are not merely gratifying and politically encouraging to the people on whose institutions theirs are so generally modeled, and who are so directly involved in the progress and fortunes of both the western continents: the fact augurs well for the future of the Spanish republics and the Portuguese empire themselves. It proves that they feel themselves well through the slough of civil war, their limbs free of its mire, and their energies ready for, if not altogether equal without aid to, the task of developing their magnificent natural heritage. When we consider the peculiar difficulties which have beset them from the beginning of their independence—ignorance of representative government, geographical and commercial isolation, lack of roads and navigation, admixture of races, a mother-country and a tongue poorly adapted to placing them in intimate relations with the progressive part of Europe—we judge more leniently of their past, and look more hopefully to the future in favor of which it seems to be receding.

The continent over the way from South America left its agricultural character mainly to the care of Liberia—Egypt, Barbary and the Cape concentrating their forces elsewhere. Ivory, coffee, cocoa, the products of the palm-nut, and arrow-root, filled her stall. This colony of reclaimed Africans, to be in fashion, presents us, like larger and older states, with her foil of outlying barbarism. To show us that African immigration to the United States—or rather to the disunited colonies—even though involuntary, was not thrown away upon the descendants of the tourists of the Middle Passage, the rude weapons and tools of those who stayed at home are adduced. Among these is the native loom, weighing two



AFRICAN LOOM.

pounds, but not differing in principle from its ponderous and elaborate cousins in Machinery Hall. Its chain is vertical instead of horizontal—a point on which some archæologists lay immense stress as a means of tracing the original families of mankind.

Portugal, by virtue of her old possessions on the West Coast, ranks as another African power. From them, as from her equally ancient and more effete colonies of Goa and Macao—historic, the one through the Jesuits, and the other through Camoens—she gathered a slender stream of Oriental commodities, less attractive by far than the display of her home provinces. It embraced a collec-

tion of wines, the greater part of them wholly unknown in this country, and familiarized only by port, that fiery liquid so dear to the British palate and consecrated as the national beverage by a famous treaty, two or three wars and the eloquence it inspired in several generations of British statesmen. The tipple of Addison and Steele, of Fox, Pitt and Sheridan, flowed from a Portuguese Helicon, the same from which our forensic aspirants are invited, in the words of Sybil Grey, travestied by their author, to drink and pay.

In appropriate juxtaposition to her wines, Lusitania buildt up a trophy of cork—a substance calculated to interest those who, like the Irish wit, have seen only *drawings* of it. More recently-devised allurements of the inner man were the fruits put up in tins. Portugal was strong in this modern specialty, but so constant a feature was it of all the exhibits as to cause difficulty in awarding the palm among the nations of best purveyor for picnics, winter desserts and military campaigns. Drying and salting were, within the memory of middle-aged people, the only methods whereby the period of fruits and meats could be turned from a season into a cycle, and these resorts were imperfect, the dried peaches succumbing to the soft influences of May, and corned beef also being bowed out by the flowers. Some unrecorded discoverer, the Columbus of tin—in the old days the Cassiterides would have been named after him—found out that heat and hermetical sealing would fix the most delicate and sapid juices for an indefinite length of time, and put an end to this trouble. Hence the great pyramids of preserved viands, hidden in metal or gleaming through glass, that towered toward every flag. In profusion the United States were easily first, as also in the perfection of the finest fruits of the temperate zone, such as pears and peaches. In these we dwarf the Europeans, and that without calling in the aid of the giants of California. In quantity as well as size the Transatlantic fruits, and the packages containing them, have by the side of ours a stunted and stinted look. The scales, the measures and the orchards are, it is easy to see, all less generous than on our fresh and careless soil. The difference in aspect is somewhat like that between delicacies for the sick and sustenance for the hale. A sombre and pharmaceutical look was imparted to the French shelves by the jars of black truffles. But we noticed in the same section a neat contrivance for unsealing the tin. This is a little projecting lip which slips into a slit in a stout wire, and is twisted off in a twinkling without burnt fingers or a smell of rosin.

These gay pyramids are so many monuments to a departed disease. They proclaim the disappearance of scurvy, a scourge formerly fought at great disadvantage with lime-juice and sauerkraut. In this good work, as well as in that of making the fruits of the earth the common property of all its inhabitants, and uniting mankind at a common table *abs ovo usque ad mala*, heat is being aided by cold. Refrigeration goes a step further than parboiling and sealing in preserving original flavor, although its effect is attained at greater cost, as it demands the maintenance of an artificial climate. A six-pound brook-trout appeared in one of the Centennial refrigerators after a congealment of three years—a trifling duration compared with that of Pallas's mammoth, but far more than sufficient for beef from our Atlantic and fruit from our Pacific shore to reach the European gourmand in the condition in which it left the stem or the shambles. These novel industries are building up populations and reclaiming wildernesses. "Where rolled the Oregon, and heard no sound save its own dashings," is heard, now, for instance, the splash of the salmon-net and the clatter of the tinman. This unmusical concert plays to the tune of three millions of dollars of yearly revenue. Large additions to this sum are derived from prepared fruits and such cognate manufactures as "condensed cider."

Some conservative virtue seems to inhere in the atmosphere of the Pacific coast. Longevity is illustrated by the Santa Barbara vine, a foot in diameter, and the

señora of San Diego, a hundred and forty years old. The vine spoke for itself in *propria persona*. Of the lady we saw but the photograph, and that justified the ascription of any age within the Methusalen limit. Desiccation appears to have been the preservative agent in her case, as in that of the astonishing hams sent by Japan from the opposite shore of the Pacific—attenuated bacon the sight

MAMMOTH GRAPEVINE, FROM CALIFORNIA.

of which would paralyze a Cincinnatian with horror, but not therefore necessarily inferior in flavor to his most fashionable brand, as the latter notoriously is to the acorn-fed Westphalian or Smithfield. But externals go a great way in deciding the popularity even of rashers, and the mikado would have done better to rest his agricultural repute wholly on his baskets, dried fish, malt for saki, and ploughs, cradles, etc. made on American models. Apropos of the cradle, it seems to have been adopted by Japan in advance of Eastern Europe. Austro-Hungary inscribes "God bless our harvest!" on a trophy of bare and rude-looking scythes. An American farmer would hardly feel authorized in offering that adjuration or asking help until he had helped himself by adding fingers to his scythe. Of course, it is never out of place, and these mottoes in habitual recognition of a higher power were a pleasant feature of all the German displays.

In that harvest which is not reaped nor gathered with fingers of wood the Danubian empire is in advance of us; as witness her fragrant and delicate Tokay. There is something very puzzling about the climatic relations of the vine. That the European grape, *Vitis vinifera*, should thrive on the shores of the Baltic, in a latitude isothermally higher than New York City, and on the elevated inland plains of Hungary, where maize ripens badly, if at all, and the peach is unknown, while it refuses to flourish even in Florida, we have never seen satisfactorily explained, though we have read many beautiful theories on the subject. The wines from the fox and muscadine family, profusely exhibited by many of the Atlantic States, the European connoisseur declines to recognize as wine at all, and our people ratify his judgment to the extent of rejecting them as a popular beverage. One reason doubtless is that they have not yet adapted themselves to the popular purse, and the necessity of fortifying them with sugar may make it very difficult to do so. Less harmless but cheaper stimulants will hold their own until domestic wine can be supplied to the consumer at a price

reduced at least one-half. It may then, if at all drinkable, force its way into general use. Malt liquors will not be in its way. Here is beer-drinking Germany making her chief stand in Agricultural Hall on the wines of the Rhine, the distinction of her section being enormous bottles and pipes labeled Rheingold that quite stare out of countenance the more modest but ample and tastefully-arranged vintage of France. With France the "barley-bree" is quite secondary, though it still has a place. She adds to wine the concoctions called liqueurs, among which was conspicuous one specimen that could not have attained the stamp of age, dating obviously from a period not more remote than 1871. This was labeled "Liqueur Patriotique," with a motto, "Souviens-toi," that must have placed the inventor at once on the high road to riches.

Let us pass from wine and war to other things which make the French section the first among those of foreign nations. The manufacture of beetroot sugar was copiously exemplified, and the specimens shown of the refined article could not be excelled. Chocolate, so much more largely consumed in France, as in England, than with us, had another prominent place. More substantial food-preparations, at which we have already glanced, are of interest on this side from the great popularity which has made them a considerable item of export. English travelers generally prefer the French portable soups, meats, etc. to those of their own country, and they appear in all our shops. The catalogues and the handsomely-lithographed figures of plants, fruits and vegetables exhibited by the French gardeners and nurserymen help to explain this superiority. They amount almost to a new branch of the fine arts. Appropriately associated with them were lithographic stones, with and without the drawing; but these we found in nearly every French department throughout the exposition. More germane to the locality we are at present traversing was a collection of plans of parks, model farms, *fermes ornées*, etc., as designed for both France and England. To the practical American eye, the predominance in these plats of curved and irregular lines and areas is striking. How that most mathematical of instruments, the plough, can adapt itself to these flowing contours becomes a question answerable only by the conclusion that the beauty rather than the productiveness of the landscape is the end proposed.

Tiles are naturally something of a specialty where the national palace is named the Tuileries, but they did not appear here in great force. The French tiles for paving purposes are not so gay and decorative as Minton's or Maw's, but the pattern is more deeply inlaid and must last better—a great merit in the estimation of observers who have noted the utter wearing away of the designs in the pavement of the new portion of the Capitol at Washington. Among such agricultural adjuncts as portable forges, scales of the most antiquated forms, and millstones of unrivaled quality, but familiar to everybody, we perceived little to remark, except some powerful-looking chains "forged without seams or welding."

Italian husbandry signalized itself chiefly in wines. The high price at which these celebrated brands are placed discourages the hope of their use becoming extended in the United States. They will remain the exclusive luxury of tourists and readers of the classics. Macaroni bears transportation better, but is in danger of being supplanted in our market by home manufacturers. The wheat from which the Italians—of the North now as well as Neapolitans—make it was shown by its side, together with a black-grained variety new to us, and Indian corn of a yellow color, small ears and irregular and badly-filled rows. The last-named cereal appeared in most of the sections, but in no country does it seem to be so completely at home as in the United States east of the Rocky Mountains. The samples from every quarter of that territory were finer than from any point outside of it. Central Italy sent some hemp that is said to be remarkable for strength and fineness of fibre. The Tuscan iron ore is another valuable possession, more eloquent of the future possibilities of Italian industry than the fruits

and other light articles which eclipse it as decorations, and which will continue to form an important part of the Peninsula's contributions to commerce.

Spain, whose display was singularly complete and satisfactory, was enabled by her colonies to add many features to those in which she resembles and competes with Italy. Cuba and the Philippines, troublesome as they may be to her politically, were efficient allies here. Their spices, oils, tobacco, sugar, mahogany, rosewood, Manila hemp, seem to offer her a sufficient fulcrum for the revival of

ITALIAN SECTION, AGRICULTURAL HALL.

her wealth and power. They are based on peculiarities of climate and other natural conditions proof against the accidents and caprices of trade and fancy. The Plate fleets that furnished the prey of Drake, Raleigh and Anson no longer seek the Spanish ports, but the Manila galleon is multiplied into many ships, and has no longer need of convoy. The revenue surplus of Cuba is, or was until within the past ten years, larger in amount than the export of silver from Mexico and Peru in the beginning of the present century, prior to their wars of independence. Thus, the part has in a certain sense become greater than the whole, thanks, no doubt, to a lingering trace of the administrative ability characteristic of the Council of the Indies three centuries ago, and perceptible through all the subsequent paralysis and disorder which crippled Spain and her government. Among her home products wines were of course prominent. Many varieties were shown with which our purchasers are altogether unfamiliar. They are too pure, we fear, to please the taste of the American market. The demand among us is for a heady wine, with a strength and flavor the grape cannot impart. Our cold-blooded race insists, as it did in the days of Falstaff, on being warmed up with sherris-sack of potency beyond what suffices for the makers of it. In that wish the Dons continue to oblige us, and they were not unprepared to carry back the choicest of their Centennial wines for their own drinking. It is something, however, that they leave us the legitimate offspring of the vineyard, vitiated though it be by education, and not the spurious yield of the American laboratory. Genuine sherry,

"all its original brightness not yet lost," with gigantic nuts, translucent raisins and the olives of history and romance,—what finer contribution could any nation make to the expanding and humanizing influences of the *après-diner*, the brilliant sunset of the symposium? In presence of this climax of the feast the dainties of other nations become gross and earthy. Canvas-backs seem oppressive, foie gras an impertinence, and roast beef and plum-pudding an insult.

For the cheese we must, after all, look to the North. Roquefort was on hand, and so, in greater strength in a double sense, was Edam. Holland, amid much ado of curaçoa, anisette, noyau and their affiliated viands, piled up pyramids of that red artillery. As ammunition for forty-two pounders it is said to have been, in stress of iron, more than once used. Commercially, its batteries refuse to be silenced by our own cheese-factories. The Dutch balls are fired into our ports in scarce diminished volleys, crossing en route the heavier missiles of Orange county and the Western Reserve. Another Dutch stand-by, not less aggressive in flavor, is the herring. That most unromantic of fishes had his commercial career epitomized from the net to the packing-box. The agricultural societies of the kingdom, of Guelderland and of Zeeland, admit him as a legitimate part of the national crop. It would be incomplete, indeed, without the harvest of the North Sea.

And there the sturdy reapers of Scandinavia thrust in their sickle. The salt sea air enveloped the sections of Denmark, Sweden and Norway, with all their land-treasures of oats, buckwheat, wax, brown bread, neat iron ploughs, kirschwasser, etc. Sweden showed the principal fishes of her coast in alcohol. Norway illustrated every process of her fisheries with exact models of the bluff-bowed and high-stemmed sloops and schooners, not unlike, in hull, the galleys of the Norse sea-rovers as we have them on medals and in illuminations. To these craft steamers have lately been added. The whale especially, placed by blue-books not given to nice zoological distinctions in the department of fishes, is pursued by steam and destroyed by gunpowder. The fleet fitted out by Norway against this harmless and obese monster is strong enough to have blown all her ancient squadrons out of the water. Hardrada armed with it might have extinguished his rival pirate William, and made the Bayeux Tapestry and the history of England tell another story. As it is, it is said to have won an unresisted victory over its cetaceous game, and to have pretty well depopulated the marine pastures that stretch broad and green "beneath the Norroway foam."

The whale bears us westward on the path of Leif, and we bring up on the coast of the Bay State. Her fisheries, being at home, were of course capable of a more thorough reproduction in model and sample than those we have just glanced at. The appliances used can hardly, as a whole, be termed more scientific, unless in the build of the vessels. This, as compared with the New England fishing-craft of 1776, showed an advance. The craft of the two periods floated side by side in a tank. On the wharves which flanked it the men and women of then and now prepared the fish after the two fashions. Whether the dried cod of the Revolution differed materially in flavor from that of to-day we are not told. If it was much inferior, the fathers are not to be envied their dinner on fish-days, and the devotion of the Catholics whom they fed on Fridays acquires a new tinge of the heroic.

New Bedford's show, were it got up as faithfully as that of Gloucester, would have set past and present in a widely-different light. An array of her decayed and dismantled whalers would have been a sad commentary on Burke's famous description of the prowess of their prototypes. That declaimer could not scent in the future the fumes of Cincinnati and Titusville. Lard oil began what petroleum finished, both of them with some aid from coal-gas, and the whale was turned loose in the Arctic and Pacific oceans until a yet undeveloped destiny shall demand him. In a country of rapid and perpetual change dead industries must here and there strew the path of progress, like ar-

tillery-horses on a line of march that have played their part and fallen by the way.

The aquaria prepared for the accommodation of inhabitants of fresh and salt water were but very imperfectly occupied. A few of the more common fish, with some turtles and terrapins, poorly represent the profusion of food that teems in our estuaries and inland waters. Particularly was it desirable that the different species of the leading genera more or less closely resembling each other should be exhibited side by side. Their habit of mutual destruction, certainly, was in the way of this, but the tanks were numerous enough to keep them from contact. What was wanting was a general control of the matter by some society or organization devoted to the subject, and able and willing to take it out of the hands of desultory private effort actuated in great part by motives of personal profit.

AQUARIA.

The collection of the Camden and Atlantic Railroad Company was the only step in that direction. The advertisements of fishmongers will never accomplish any national or international object. The most patient and ardent students of this branch who met our eye were a group of lads watching a tank containing a pickerel and its destined dinner, an unhappy minnow which stuck to the farthest corner, and could not be frightened into the jaws of its hungry and vigilant congener.

Fish are becoming prominent as an intermediate or indirect, as well as a direct, aliment. Small fleets of tugs and sloops are employed at several points on the coast in taking them for the manufacture of fertilizers. An oil useful for several purposes is the first result, and the residuum is packed for the farmer. This business, and the gathering of seawrack for the same use, and of carrageen on the coast of Massachusetts for food, were sufficiently represented in the United States section.

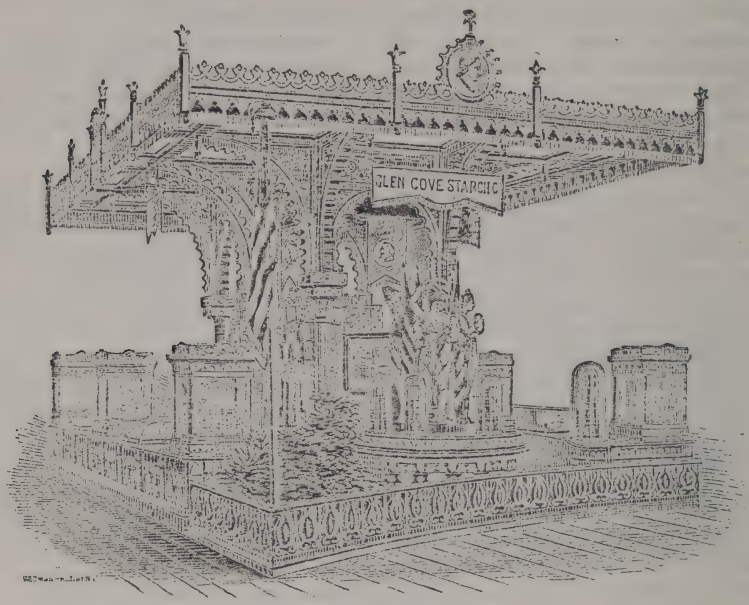
This way of making the water enrich the land is a new one only in the scale and the system on which it is followed. The extraction of fertility from the deposits of long extinct seas is more strictly novel. The use of marl, one such formation, is as old as Virgil and Columella, but they knew of nothing like the Carolina coprolites and the phosphatic accretions which accompany them. Samples from these beds appeared at the exposition, with sharks' teeth too perfect almost to deserve the name of fossil. Many specimens of fertilizers of nearly-identical composition made from recent bones were exhibited also, making up an array that should, strictly, be made to pass through the hands of the chemist before being allowed to address the farmer. One or two manufacturers adopted the idea of convincing the cultivator by the practical test; hence sundry dry beds of luxuriant

plants labeled conspicuously as the outgrowth of this or the other company's guano, superphosphate, etc. As to whether it and nothing else was really applied, and if so in what quantity, there was no discoverable certificate. Nor was there any guarantee that the purchaser could be sure of getting the same article that produced these Jonah's gourds. Nothing else in the agricultural department draws so largely upon faith, and may deceive so easily and disastrously, as these neatly-prepared powders, as mysterious, and to non-professionals as unfathomable in composition, as the powders prescribed by regular physicians a couple of centuries ago, and by quacks to-day.

Perfectly tangible and trustworthy, on the contrary, were the samples of virgin soil from Iowa. Sections from each of the thirty-nine counties of the State stood in glass tubes six feet high. Blackhawk gives security against famine for many times seven years (barring the grasshoppers) with five feet of vegetable mould, Jasper with four and a half feet, and so on down to a minimum which any one of the old States would think, for an average allowance of humus over her whole surface, plenty personified. But some of this mould is peaty, the vegetable fibre being still traceable, and sure to dwindle quickly under the operation of reagents which cultivation would introduce by exposing it to the atmosphere. The question is one of durability. Of the productiveness of the North-western soils when fresh the grains and fruits on exhibition were ample evidence, supposing any to be needed. Five hundred varieties of grain and three hundred of fruits in casts, with one hundred and sixty species of trees, all fair and clean in growth, gave an enticing aspect to this sample commonwealth of the Prairies. In contemplating her exhibit we forgot to ask questions in regard to climate or other drawbacks. There is nothing arctic in the look of the Iowan apples and corn. The former are said to adapt themselves to the extreme cold of the winter, and to evolve finer varieties from the crab, generally considered the highest attainable type under — 30°. The acclimation of plants is a rare and difficult thing. Should Iowa really accomplish it, she will have done much for the rest of the world and for natural science, to say nothing of the immediate benefit to herself.

Iowa is *not* the north-western paradise of vegetation. She is but one of its provinces. Some of her neighbors longer, and others less, known afford striking evidences of the wealth the ages have occupied themselves in accumulating for the farmer's use. Illinois, belonging to the previous generation of commonwealths, stands rather upon the dignity of age, and was not so profuse in her display. What she could do in corn and wheat we all knew before, but her State college thought it worth while to show three hundred samples of corn from the different counties. More novel and interesting are the culture of the sugar-beet and that of forest trees. The former cannot be said to be in a progressive condition: the latter will probably be outdone by the birds in clothing the bare expanses of the Prairie State with timber trees. Groves, belts and patches planted by hand, under the stimulus of the premiums we see offered by all the young Western States, will furnish nuclei for the more extensive plantations we shall owe to those social and musical little benefactors of man. "We" is a proper expression here, for the advantage to result from the afforesting of the vast treeless plains which stretch from Lake Michigan to the foothills of the Rocky Mountains will not be confined to the dwellers upon them. The inhabitants of the entire territory stretching to the Atlantic will be blest in the partial taming of the north-western winds that bring drought in summer and sharp cold in winter. The birds, too, sheltered by the woodland homes they will build up for themselves, will perform another service in destroying insects now seriously mischievous in that region, and others as yet unknown there, but sadly familiar at the East, and sure to be soon at work upon the wax-like fruits and gigantic and uncankered grains whereof our Western friends are so proud. Man cannot emigrate alone. He carries with him not only his domestic animals and the asso-

ciated wild ones, but an entomological menagerie more numerous than all together is close at his heels. The innumerable race of moths and butterflies is as keen as he for the land of promise. They pay no railroad fare, and take not the smallest note of the appeals, in voice or print, of emigrant-runners. Saunter-



GLEN COVE STARCH COMPANY'S EXHIBIT, AGRICULTURAL HALL.

ing along on wings from stage to stage, or comfortably ensconced in a nidus surrounded with ample provision and traveling more rapidly, they seek their new heritage in wheat-field and orchard.

Wisconsin is endowed with forests of original growth, which have been seriously depleted to supply the needs of her less fortunate neighbors. To her specimens of timber she added in her other departments the less expected product of tobacco. The "weed," however, is not likely to become a staple in her zone. It has long thriven in the valley of the lower Connecticut, but there it finds a special climate prepared for it by local influences, as the more tender fruits do on the eastern shore of Lake Michigan, opposite Wisconsin, where they take her western blasts in a dilute form and enable the Peninsular State to make wine prominent in her display.

The black walnut of Indiana is an object as difficult to overlook as the redwood and other light but bulky timbers of the Pacific slope. It is of increasing value for ornamental woodwork, and furnishes carvers especially with their favorite material. This tree almost appears to have reserved itself for the high office of mahogany, vacated at the mandate of popular whim. It revolts at the degrading position of fuel, and does its best to burn out of house and home the man who condemns it to that duty. A few sticks of black walnut suffice to discredit a load of firewood in the estimation of the housekeeper, who well knows that its loud and fiery protests will be heard and seen before it has been long upon the hearth. In treeless Nebraska, with no other choice but cottonwood, willow and aspen, the axe would nevertheless not have spared it. She can show only buried forests. The fuel they supply she presents us, half piteously, in peat —a common resource in most northern countries, but not much of a shield against her intense frosts. Not that Nebraska has no coal. She exhibited that

also, as did the other States and Territories of the Plains, but it is nowhere of fine quality or in such seams as those of the Alleghanies.

Kansas and Colorado came early to the conclusion that the common hall would not yield space for the proper development of their treasures, and they united in preparing a receptacle of their own inferior in attractiveness and varied interest to but few structures upon the ground. The share of Kansas in the decorative part consisted mainly in immense festoons of wheat and maize. Her sister State added an infusion of the romantic in the hermitage of Mrs. Maxwell the huntress. Around and above the head of this quiet little lady hovered and leaped the victims of her skill with the rifle and in taxidermy. The grizzly and the beaver, the buffalo and the cougar, appeared in their habits as they lived, nothing artificial but a cataract of Schuylkill water to simulate the wild rills of their native mountains. Grouped around and among them were specimens of all the creatures any one but a naturalist could have discovered. Gordon Cumming might have shown a collection richer in the Carnivora and in other large animals, and amassed at greater personal risk, but Cumming was a man, and Mrs. Maxwell never had an opportunity of trying her prowess among lions and elephants.

In the mountaineer's museum agriculture was not conspicuous. As little did we trace its domain in the coal, gypsum and salt of Kansas and the gold, silver and tellurium of Colorado. The last-named metal is expected to prove a discovery of particular value, having been found elsewhere only in California and Hungary. To the farmer's field we are brought back by an array of the statistics of agriculture in the several counties of Kansas. These were full and well arranged, so as to show at a glance the condition of this great interest in any part of the State. They produced the impression that the older States have less to add to than to learn from the agricultural system and organization of some of their younger sisters, and that Kansas at least may very well be trusted to grapple unaided with the peculiar difficulties which beset her.

That California should have set up a tabernacle of her own was almost unavoidable. Her soil is an agricultural microcosm. It may be said, with the least possible exaggeration, to embrace the products of all the rest of the United States, with Europe and a slice of the tropics. Her mountains rising to the snow-line, and her littoral territory extending seven hundred miles north and south, give her all the zones superimposed or placed side by side. It is thus in no way singular that she should lead in wool, wheat, silk-cocoons and fruit. The manufacture of beetroot-sugar she has succeeded in establishing, and would deserve more credit for that success were the share in it of the despised Chinese more frankly acknowledged. Her vintage is stated to reach ten millions of gallons, and the value of her fruit and dairy products over seven millions of dollars. This, however, is but a small showing by the side of her revenue from wheat for the centenary year, which was estimated by a speaker at the reunion of Californians on the 9th of September at forty-seven millions of dollars! This says nothing of her wool and barley, both of which she exports largely. Of timber she is an importer, despite the exhibit of two hundred and fifty species and varieties of native woods. Ores and minerals include, besides the staples of gold and silver, alabaster, marbles, garnets, mercury, borax and a long list of others. Probably no community of only seven hundred thousand souls anywhere sends abroad an equal sum in its own products. Those concerned should not forget that it is capital they are parting with at such a rate, products being only a convenient term. Mining countries export a fund they had no hand in creating; and in the case of gold, California's chief metal, that fund is easily reached and rapidly dwindles. The humus so enormously fruitful belongs to the same mineral patrimony, and once exhausted is difficult to replace, particularly in so dry and windy a climate, where

sun and wind burn and blow away the grasses every summer, and in most of the counties sod is unknown.

Not all the States of the Union indulged in separate exhibits, and among those failing to do so were some whose absence materially marred the completeness of the exhibition. A New Jersey notability was a miniature cranberry-bog, with living plants. Massachusetts seems to be declining this line of business in her favor. The Bay State is becoming highly scientific over the remnant of agricultural vigor spared her by a poor soil and the diversion of labor into manufactures. Charts of farm-products, farm-values, agricultural societies and distribution of breeds in the different sections of the State went to show that the decay of an occupation to which the New England character owes so many of its solid qualities is not due to neglect on the part of the State government. The Southern States were but feebly represented. Maryland's exhibit of minerals, oyster-catching, canning, etc. was reserved for her

DAVID LANDRETH & SONS' EXHIBIT, AGRICULTURAL HALL

own building. A Louisville firm extracted from tobacco as much of the ornamental as the various preparations of that unpromising material could be made to express. This was the most brilliant thing from the Blue-grass State. Virginia was not discoverable. Tappahannock wheat, horse-tooth corn, Roanoke tobacco and the Nansemond potato were sent from all regions but that of their origin. Florida contributed some dried fruits and jellies and fabrics of palmetto. Arkansas devoted a pavilion to grain, grapes, cotton, wine, lead ore, gypsum, zinc, kaolin, etc., not forgetting gems from the Hot Springs. Generally, however, the Cotton Belt did not shine. From the Chesapeake round to the Rio del Norte is a deplorable blank.

A running exhibit of perishable fruits and esculents went through the season. One after another they dropped in to make their Centennial report—old Fuller's favorite, the strawberry, than which he said, the Creator might have made a

better fruit, but never did; the "respis," also a lover of the woodside; the apricot, larger and more luscious than in its native home on the Himalaya; the peach, a literary and artistic character in Europe, but in this more prolific and prosaic country belonging to trade, the railroad and the tinkers; the pear, fresh and golden and monstrous from the Pacific; and the plum and apple from everywhere. In this feature we had Europe at a disadvantage: the international idea necessarily disappeared. Our visitors could only look on and admire, for the refrigerating steamships refrigerate in one direction only, and bring nothing back. Otherwise, we might have had the Fontainebleau chasselas; the reality of the infinite diversities of Spanish grapes which that country shows us in lithograph; Lancashire gooseberries; and, though last, in no sense least, English cauliflowers. But could they have done anything that hot-houses and California cannot do? "Gooseberries," one may perhaps answer, but gooseberries are rather better in glass than fresh. In their sunless home they only swell, and never really ripen. Our little specimens probably have more flavor than the Crown Bobs and Red Lions.

WEBSTER'S PLOUGH.

Internationalism came again to the surface when the question was of those other evanescent allies of agriculture, horses, beeves, swine, sheep and dogs. Canada, France and England joined America under one and the same humble roof, and lifted up together the untranslated but expressive lingo that makes vocal the steading. That—whatever may be said of man himself—his four-footed companions have decidedly improved during the century was made abundantly clear. Taken as a mass, we mean, for the blood-horse has not markedly gained in combined speed and endurance; New Hampshire's thirteen-hundredweight pig was overmatched long ago by Yorkshire's sixteen-hundred-pounders; and the Scottish deerhound is alleged to have diminished in size.

The unfeasibility of holding the live-stock display on the exhibition grounds caused it to be seen by but a small fraction of the visitors, but this fraction included those best qualified to appreciate it—"fit, though few." Foreign stock is a common sight at the local autumnal fairs, and the average Centennial tourist was not disposed to wander far from the centre of attraction to seek objects he was wont to pass with a glance at home, content to know that competition among breeders, butchers, packers, wool-manufacturers and horse-fanciers is constantly offering better premiums than can be obtained from the most extensive and pretentious of exhibitions; that the weight of carcase and fleece is steadily increasing; and that the trotting horse gains a second or two on time every year. The dogs might well have been separated from the other animals and allotted a place within the walls. There they would have pleased many who had no mission for the inspection of pigs and cattle, and the sheep-farmer would have viewed them with a more genial eye at a greater distance from his wards. Among the other incidentals of American politics an anti-dog party frequently shows itself, and now and then carries a legislature. Civilization has but slightly modified Tray's weakness for mutton, consequently he often figures in the statute-book, and always unfavorably. Legislation for the encouragement of the dog is a thing unknown. Our Solons exactly reverse his real record, and make his one crime outweigh his thousand virtues. The merits of such guardians of the flock as the great white dogs of Spain and the collies of Scotland weigh imperceptibly against the sins of the canine rabble.

INTERIOR OF HORTICULTURAL HALL.

Persevering attempts at solving the great problem of good bread for the million cropped up in all parts of the hall. Five or six hundred kinds of hard biscuit might be counted by a statistician inclined to that field. Indeed, a single baker from Albany pointed proudly to three hundred varieties of this dry provender artistically arranged in glass boxes and piled into the semblance of a pavilion. And he was but one of many. The crackeries of all nations competed. Then, compassionate of the teeth of the masses, the porridge-makers varied the farinaceous entertainment. Starch companies rigged their acolytes in the traditional paper cap and uniform of unbroken white, and gratified all comers with puddings and with the satisfaction of further encouraging a business of American origin, extreme youth and immense present proportions. In round numbers, the annual yield of Indian corn in the United States amounts to twenty bushels per head of the population. Any plan looking to the rescue of the surplus from the fireplace and the still could not fail to be a public blessing. Its liability to mould in bulk, either ground or unground, interferes with its exportation, although, with the help of fast steamers, that difficulty is being measurably overcome. Two or three decades since the idea occurred to some one in Western New York to reduce the meal to starch and place it in small close packages. "Corn-flour" has now become a common aliment in Great Britain, whose local papers are full of its advertisements, the generic name of corn, once made to embrace all grains, thus being yielded to specialization by our conservative cousins. They hand us in return, from their end of the family table, oatmeal, Dr. Johnson to the contrary notwithstanding. Nothing can be better for the young: it builds up the frames of men, colts and pigs more rapidly and solidly than maize, and its introduction is an undoubted gain to our *menu*. Oatmeal, however, was also unsuited to sea-voyages. The taste for it once established, it became an article of home growth, with marked advantage to the farmers on both sides of our northern frontier. The standing food of this country and Western Europe, the flour of wheat sifted to the last whiteness, and so turned into a sort of medical extract, essays by many devices to hold its own intact against the northern invader. Thus we have "self-raising flour," treated with some form of soda, and ready to swell into elegant indigestibility under the simplest application of water and heat—a labor-saving contrivance worthy of a better cause. Macaroni, an American manufacture of rather longer stand-

ing, takes to itself a humbler place and is less demonstrative. In quality it will not approach the Italian until our makers use more care in selecting the dryer and more glutinous wheats.

These articles bring us into the province of machinery. The primeval-looking windmill set up near the centre of the building by an exhibitor represented the nearest approach to a machine known to those whose bread it ground. Compared with the sickle and flail that fed it, it was complexity itself. Compared with their modern substitutes, the reaper and threshing-machine, it became all simplicity. The *dura ilia messorum* are harder than ever, being of iron. To the young students of the next generation the scythe of Saturn and the sickle of Ceres will become as purely mythical and incomprehensible as the biography of those characters. Those antique tools were never used except for cutting grass and the small grains. Machines which reap, rake, bind and toss or tend—a corruption of *ted* which ought to be discarded—have long expelled them from the harvest-field and meadow, and now assume to extend their sway to fresh fields and pastures new. They attack the firm and stately ranks of maize and mine the obstinate and baffling potato. The records of the Patent Office are full of inventions for these two purposes, and several which claim perfection are exhibited. Doubtless, this consummation is a mere question of time, and the farmer of the near future shall see the hoe driven from its citadel in the potato-hill, and his hands released from wrestling with the flinty husk and stem of what Cobbett called the most magnificent of grasses.

For the last polishing touches, such as are dealt by the engraver's needle and the painter's sable, tools wielded by hand will remain indispensable. These, too, will be, as a glance at the specimens on exhibition told, comparable in delicacy and scientific adaptation to the art-implements we have likened them to. The old iron hay-fork is to its keen, ethereal and elastic steel successor as the old table-fork is to its supplanter of silver. That there should be so much strength in these fragile-looking tines is easier to realize when we observe the extent to which economy of material has been carried in appliances designed to meet the heaviest strain—for instance, the series of levers and ratchets worked easily by one person in lifting from its roots the stump of a tree.

Daniel Webster's plough, a mass of wood and iron remarkable for anything else than saving of material, is a projection of the past into the present. It might very well have been used by his father or grandfather in subduing the rugged New Hampshire soil. But it did its work well, according to the great expounder's certificate of good behavior attached to the beam, and left him no cause to envy more shapely structures. Webster's attachment to rural occupations was apparently genuine. He was one of a long list of intellectual athletes who, Antæus-like, were wont to draw fresh strength from the bosom of Mother Earth. As with many of them, his profit was of the mind and nerves rather than of the pocket. His plough is not so elaborately framed as his theory of the Constitution, and secures a place among the fabrics of New Hampshire only by virtue of its parentage. Ploughs, indeed, are not at all germane to her specialty as a food-producer. Her maple-"orchards," the yield and management of which her section fully illustrated, are quite independent of aid from tillage. They furnish a northern counterpart to the India-rubber forests of the tropics, represented in another part of the hall by young plants and specimens of the crude gum. These were contributed from Boston, and point to an industry much more important and progressive than the making of maple-sugar, and suggestive of nothing about politicians but the elasticity of their principles.

That the world is able to feed and clothe itself, and has small cause to fear a recurrence of famine and fig-leaves, is a conviction every one will have borne away from these Gothic portals that enclose so little of the Gothic. It is, moreover, clear that this encouraging state of things is both general and particular—that there are but few localities in which

it does not hold, and the number of these is diminishing. The advance of culture cannot be said to leave any deserts behind it. Changes occur in the staples of both old and new countries, but the changes are in the way of addition and accession more frequently than of subtraction. New products become common property, and the old ones are stimulated by improved methods and wider markets. Men live more and more on what to their ancestors were, if known to them at all, luxuries; and the substantials—or, which is the same thing, means of producing them instantly on demand—remain as a reserve. The growth of cities everywhere, and not in isolated countries only, as formerly, proves that agriculture can spare the hands it sends them. When they are needed the movement will stop. The new mines of wheat, wool and flax, are hardly less astonishing than those of gold and silver. The question in hand becomes rather the replanting of the forests than the extraction of additional food-supplies from the cleared land. India, notwithstanding the dearths which still occur at lengthened intervals and of less serious nature at some points of her territory, is able to abstract an increasing area from the production of food for the growth of jute, cotton and opium. The rich plains of Southern Russia and Poland find more profitable crops than wheat, and esparto-grass for the French and English paper-mill takes possession of the vegas of Spain.

STAIRWAY IN HORTICULTURAL HALL.

A precipitous ravine draws an inappropriately abrupt frontier between the expositional domains of the farmer and the gardener. The blending should have been made imperceptible. Instead of stepping from the bare and colorless purlieus of the Agricultural Building into the car of that time-honored or dishonored suppliant for public favor, a one-railed railroad, and being twitched along the edge of a scantling into a brilliant spread of turf, coleus and geraniums, we should have been prevented from knowing where the tassels of maize ceased to nod and the rose began to glow. The farmer is a florist. In early June he gazes, probably with pride, and certainly with deep interest, on more acres of flowers than his gardening neighbor raises in a lifetime. A little later the blossoms of wheat, as conspicuous as those of mignonette, give place to the crimson clover, and that in

turn to semi-tropical maize, more graceful than caladium and stately as the banana. The white bloom of buckwheat, vocal with bees, winds up his year more brightly than the aster or chrysanthemum. It may, indeed, be a floral surfeit that disinclines him to borrow from horticulture. But flowers are one of the few things in which plethora is impossible. Properly disposed as regards variety, mass and opposition of color, they can as little be overdone as pictures. Even weeds are but plants out of place. The India-rubber tree is inferior in beauty and fragrance to its humble relative, the asclepias or silk-pod of our fence-corners, and the burdock before it dons its burs is a charming thing to sketch. All the tenants of the parterre and conservatory are weeds somewhere.

But as we step from our shaky Al-Sirat into a paradise ahead of Mohammed's we forget to inquire whether Mr. and Mrs. Giles have come with us or not. We have left a temporary booth and its more or less perishable contents for a structure which has obviously "come to stay," its walls sheltering within and overlooking without the flowers of all nations on their own roots, and flourishing as though they breathed their own air. On what a scale this assemblage was made we gather from such facts as the contribution of twenty-five varieties of maples from Japan, besides a corresponding collection from the same new and distant region of camellias, conifers and other evergreens, azaleas, etc. Cuba, through the government and private exhibitors, took the foremost place in exhibits direct from the tropics. Brazil followed. More ample offerings of greenhouse trees and shrubs came from the United States Botanic Garden and Agricultural Department, and from the nurseries of England and the United States. The Washington conservatories look to the introduction of fruits and fibres that may be found available in this country, and have accordingly a more utilitarian character than those of private growers. They send the cocoa, guava, papaw, rose-apple, mango, banana of several varieties besides those which are hardy in Florida, date and other palms. The eucalyptus, or Australian blue gum, hardy in California and probably in the Atlantic States south of 35° or 36°, requires protection in this latitude. Where hardy it is said to disarm malaria, and it has been largely planted with that view in miasmatic localities in Italy, Spain, Southern France and Algeria. Some maintain that its reputation in this respect is chiefly due to its rapidity of growth. It makes in this way more striking the improvement in healthfulness consequent upon the surrounding of dwellings in malarious districts by a belt of trees.

The Robert Morris sago-palm, a century and a half old and ten feet high, would be disowned by the tropics. It is evidence that to some things a northern climate fails to impart vigor. More curious are the insectivorous plants, long known, but lately infused with new life by the magic touch of Darwin. One species is shown from Australia, another from Java and one from North Carolina. The assimilation of animal matter by plants through the roots having always been so notorious, the sensation caused by the discovery that some of them absorb it through the leaf-pores is somewhat surprising. Why should not the drosera live on flies as well as the apple tree on Roger Williams, or the peach on André?

Mr. Waterer's English rhododendrons were the lion of their short day—a day which cannot, we fear, be prolonged or repeated in the Centennial grounds. An American exhibitor, Mr. Parsons of Flushing, has for years endeavored to make this fine evergreen at home under our sky, but with only partial success. He exhibited seventy varieties. The summer seems to be a more trying period with most kinds than the winter. The common kalmias of our hills, more showy than many of the rhododendrons, are seldom seen upon the lawn by reason of their requirement of shade. Ivy also avoids the direct rays of the sun, but will grow well with a northern exposure and on the trunk of the acacia. It was exhibited in forty varieties by Hoopes & Thomas. Our command of arboreal evergreens is

further attested by five hundred kinds from the same firm. Mr. Meehan's seven hundred deciduous trees, all practically hardy, amply extend the resources of our planters. They help to reconcile us to the loss of the California sequoias and the cedar of Lebanon, the leading modern ornaments of the English parks. The holly is another tree of exceeding beauty and rich in association which cannot be depended upon north of the Delaware, though New Jersey leads it, with the cypress and the liquidamber, from the South along the shelter of the coast. It is to be hoped that the variegated hollies presented by Messrs. Veitch & Sons of London to the Commission may prove hardy, as also the Portugal laurels and other plants of open-air growth in England included in the same gift. The coming American country-seat will date many of its features from the exposition. Its thousand-year oaks are yet, we fear, to be planted. In the old country entail has guarded them since the Heptarchy. That shield from the axe they will never enjoy here. Land will continue to be a chattel, rural homes but encampments, and deer-parks a name for plank hotels. Yet our people like trees and plants, and are fond of cherishing the fancy of a dwelling-place where the family may root itself with the rocks and woods. It is a valuable taste and a wholesome craving. Let us not distrust those who are to come after us. Our tastes will doubtless be theirs, and all the more if we hand them down in the tangible and beautiful form of a fir, an oak, or a wall secured against destruction by the green seal of ivy. An eloquent appeal to this end comes from these hills chosen for the site of the exposition, rich chiefly in the old trees left to them, and from the evident appreciation of them by those to whom they belong and the thousands from a distance who see them for the first time.

In-door gardening is the only resource in our climate during a third of the year, and it is a resource within the reach of all. The furnaces and self-feeding stoves so abhorred of the doctors are loved of the flowers. The temperature can be easily graduated with the aid of the doors and windows, and there is no need of plants

GROUP OF CYCAS, FERN-PALM AND BANANA TREE IN HORTICULTURAL HALL.

suffering from dry or vitiated air. Window-gardens are the conservatories of the million, and exhibitors hastened to recognize their growing popularity. Flower-stands, ferneries, Wardian cases, aquaria and self-watering flower-baskets match the open-air furniture of lawn-mowers, garden-engines, chairs and tables, trellises and tools in greater profusion and variety than any one person, however enthusiastic and omniscient as a cultivator, ever saw before. They came from manufacturers in every part of the country, showing how general is the demand.

Garden statuary is not usually of a high order of art, and we did not expect to see Memorial Hall rivaled in that line by its gay neighbor. Messrs. Doulton in terra-cotta, Baird in marble, Wood in iron, and others whose works are less conspicuous, creditably sustained this school of sculpture. To our eye, a bit of garden statuary is most pleasing when, like

Hermes, Terminus and such-like gods of the pleasance and the grove, who were unfinished below the bust, it is mostly concealed by shrubbery and vines. It should be an accessory rather than a principal object. This office is filled not quite so well by rocks, or even rock-work. The erection which underlies the fountain in the centre of the hall will grow more attractive as it disappears from sight and becomes the barely visible core of a mass of graceful plants.

The most intensely artificial objects to be seen in this abode of natural beauty are the French bouquet-holders in filigree of paper and metal. If something there must be to protect the fingers from contact with a flower, these marvels of fancy and scissors-craft will do as well as anything else. And indestructible garlands for the grave are fitly made of the immortelles which appear by their side, and unite, like one of Gérôme's pictures, the festal and funereal. We confess to a dislike for flowers which do not decay. They are not true to their nature and their mission; they refuse to teach the lesson that makes them symbolically and morally expressive; and they become thus an impertinence, like artificial flowers. They have no leaves, and do not look as if they ever had any, or were in the least discomposed at being separated from the parent stalk. That they ever warmed with sap, expanded to the sun or drank in the shower we must take on trust entirely. They would be more honest and truthful, in fact, if made of rags, thread, wire and sealing-wax, like the similar *choses de Paris* that deck the milliner's shelves. Give us in preference the French roses that bloom around by the thousand—Luxembourg, Souvenir de Malmaison, Maréchal Niel, Safrano, and so on in line growing longer year by year.

No part of the exposition programme was better wrought out than that entrusted to the knights of the spade and watering-pot. The almanac was not more true than the successive seasons to their demands upon them. Acres of clay turned into green velvet before the frost was well away. Then came, in due and ordered perfection, as laid down by line and label, hyacinth, tulip, rhododendron, gladiolus and dahlia, with great vermilion and purple banks of foliage plants and ornamental grasses that lasted through all the floral epochs. It was a manufacturing process carried on under our eyes, as precise in its methods and exact in its results as any of the loom or the iron mill. It took as little heed of the weather as though it too had been under roof. Drought was disregarded. The completed fabric was not altogether so durable as the less gay tissues we saw turned out of silk and wool in Machinery Hall: it will not stand winter wear. But it can be put together another year and another, when the silks are frayed and the carpets trodden into strings. If this machine-like science could only be made to work as well by the farmers we left on the other hill! If they could command as implicit obedience from wheat-field, meadow, orchard and fold as these gardeners do from their bulbs and slips! Why should that attainment be hopeless? At least it may be sought, and by seeking it must needs be approached. There is ten times as much machinery—*i. e.*, stored and crystallized thought, inquiry and experiment—in yonder hall as in this. The garden cuts but a small figure in the Patent Office.

After all, we may be presumptuous in hinting that the craftsman who keeps us all in food and raiment might still further systematize his business, and is not as competent to discount the ups and downs of the weather as the bulls and bears are to discount those of the stock-market. To apply the forces of Nature to the production of Clydesdales, Conestogas, Percherons, Durhams and thirteen-foot cornstalks can not rank below the creation, regardless of the thermometer, of strawberries and geraniums. And it must be confessed that if the Moresque arches and their translucent domes place us in a land of beauty, the green vaults—in some senses richer than those of Dresden—over the way satisfy us that we live in a land of plenty.

PART XII

DETACHED EXHIBITS.

INTERIOR OF THE UNITED STATES GOVERNMENT BUILDING.

OUR concluding paper must be necessarily in some sort a summary. It cannot more properly open than with notes of the special exhibit made by the government of the most composite and cosmopolitan of peoples. The territory of the United States is held by members of nearly all the races, and extends into all the climates. A full illustration of its capabilities and actual condition could not but have an international air; and this aspect is not weakened when the

fact is recalled that ours is the only government which assumed at its inception a proselytizing rôle and offered itself as a pattern to all the nations of the globe. Its Centennial guests, while not ignorant that the individual achievements of those who live under and sustain it were the best tests of its success in a self-arrogated mission, looked with interest to the demonstration of efficiency and sagacity in the sphere of activity reserved to its direct control.

The magnitude of this sphere was not realized, it is safe to say, by the American people themselves until they saw it proved by the collection here made. It gave palpable and striking evidence of the multiplicity of concerns a government of limited powers, existing by virtue of an instrument that would not fill a newspaper page, has to look after, of the wide responsibilities resting upon it, and of the novel draughts upon its powers of adaptation and execution perpetually superadded to and complicating its normal duties. It is, for instance, the largest land-owner in the world, the largest surveyor, the largest publisher—as witness thousands of volumes of census, agricultural and scientific reports, to say nothing of the regular blue-books and that Maelström of oratory the *Congressional Globe*—and, since the acquisition of the Alaskan seal-islands, one of the largest fur-traders. The soil under its immediate control is underlaid by a fund of mineral wealth the task of vaguely measuring which it is hardly able to undertake. Many thousand miles of coast on two great oceans, presenting every sort of profile, beaten by an equal variety of winds and currents, and indented with innumerable estuaries, exact the utmost vigilance from its seaward glance, and a corresponding chain of forts, lighthouses and signal-stations requires to be constantly maintained and added to. These are some of the cares superimposed by a new continent on the ordinary functions of a central government.

In selecting and arranging the contents of the United States Building the hands of men accustomed to system were apparent. The organization could not easily have been better. The provinces of the several departments were kept separate, and the study of each in all its parts sufficiently assisted. One field prominent in the work of most European governments has no place in that of ours. It builds no railroads. It owns no telegraphs, save a few between the frontier-posts, and can point to but one canal of its own construction—that around the Sault Ste. Marie. In architecture it comes better to the front, owing to the call for public offices at the capital and in some scores of rapidly-growing cities. In detailed topographical maps, again, it could not stand abreast of its contemporaries. Time did not admit of their preparation for the immense area of the Territories, and in the settled portions of the country the States assumed that office, with so far, it must be owned, an inadequate discharge of it. The time has not yet come to attempt rivaling the ordnance maps of England and the magnificent works of like character executed by the French and Swiss governments. The Coast Survey charts mark our modest path in their rear. A relief-map is attempted of the remarkable region of the upper Colorado, where the glaciers of the ice-age appear to have failed in manufacturing hill and dale, and left the submerged mesas to rise flat and intact after they had melted; but this, like some others, is on a small scale, and makes no pretence of minute precision. The geological maps are also imperfect. The perfecting of them must be a labor of time—one for which go-ahead philosophers like Professor Marsh are not inclined to wait. Like the practical bridge-builder of the story, they erect the structure without a draught to go by, and take a leisurely look at "the pictures" afterward.

Yet in one shape or another science assumed a leading position in the U. S. pavilion; and from that designation we exclude the science of murder, eminently complicated and profound as were the contrivances shown in that branch of modern progress and inquiry. Stabbing and shooting were not made to seem so much the great aim of existence as in sundry foreign sections.

Let us get gunnery and cutlery out of the way first, and pass then to pursuits more respectable and better worthy national attention. It is something of a comfort to be able to say that artillery is in a state of indecision, shaky on its trunnions, so to speak, and unprepared to let us know in exactly what guise it proposes to face the next war. Here rested a familiar-looking exterminator of the Dahlgren variety, shaped like a champagne-bottle. As an old friend among strangers, we advanced toward it, but discovered that, as not unfrequently happens among friends, it was the same only in outward aspect. Instead of projecting, as it originally did, an eleven-inch shell, it had been filled in with a wrought-iron tube

"DUG-OUT," FROM BRITISH COLUMBIA, IN THE UNITED STATES GOVERNMENT BUILDING.

and made an eight-inch rifle. As this gun was labeled as having been fired seven hundred and fifty times without damage (to itself), the plan must have its advantages. The same form, so severely tested, was further adopted for a nine-inch breech-loading rifle of the Sutcliff pattern. Another breech-loader, remarkable for the simplicity and compactness of its shifting parts, is the Thompson rifle, weighing forty-two tons and throwing a projectile of six hundred pounds. The Woodbridge muzzle-loading rifle weighs but fifteen tons and carries a shot of four hundred pounds. The last-named arm is made of wrought-iron bands overlapping each other and brass-welded. The artisan had obviously made these neat and artistically-closed joints—a coalition of the bronze and iron periods in gunnery—a labor of love. But, like a good deal of devotion that is bestowed upon a better cause, there can be no certainty of its success and gratification. Each new gun supplants an old one, and has the same fate to anticipate for itself. In the days of Nelson conservatism in cannon prevailed. The big guns knew themselves, and had done it for a century. One pattern had swallowed up the rest and monopolized the trade of slaughter. When to that was at length added the pursy carronade, the innovation created a stir, but the new-comer, differing from the old chiefly in abbreviated stature, was assigned to secondary and trifling duty at short range. For another half century the old form resumed its empire, until change, experiment and improvement invaded the ordnance-yards as they had done broader arenas.

The Gatling, Hotchkiss and Billinghurst machines for ejecting balls by the bucket-full, as fast as they can be poured in, may represent the place of the carronade in the land-service. The trouble with these machine-guns is that they require a second army to carry their ammunition. That they are not looked on as much of a stand-by for future conflicts is evidenced by the elaboration shown in presenting the manufacture of the regulation army rifle in full operation at a rate that secures the production of four guns in five days by each operative. This is doing three times as well—or ill, as a Peace Congressman might prefer putting it—as thirty years ago, and leaves for the chief difficulty the finding of men enough to stand behind the rifles. At

the beginning of the century the trouble was precisely the reverse. How laboriously the requisite apparatus for manufacturing a free and independent nation was shaped and put together is expressed in a Continental siege-gun on exhibition. Upon this piece and its limber, with patched spokes, felloes and ties, iron enough, not to count the excess of timber, was bestowed to make a complete carriage of to-day. The twelve hundred machines employed in the production of a Springfield rifle are but a change in degree from the old practice, some machinery having been used even then; but the making of percussion-caps and shells for breech-loaders by women is a complete novelty, that copper coinage for forced circulation being a strictly modern affair.

These and other military wonders, such as dainty bottles of choice gunpowder, swords and pistols of all times and styles, delicate diagrams and electric wires which enable you to trace the trajectory and measure the velocity of a ball fired before your eyes, might have been matched by the war departments of other governments, and were in no way the peculiar boast of ours. But they helped to get up a *digito monstrari*, and were furthermore assuring to some millions of starers as proving what careful arrangements for their defence had been made by those to whom it is entrusted. Amusement, too, was provided in the figures of soldiers and sailors clad in uniforms fashionable or obsolete — "every species of nonsense," as Sydney Smith says, "sartorial and plumigerous." These effigies were less lifelike than those in the Swedish display: the absence of anything to represent the muscular and osseous system being as conspicuous as in the smooth and nerveless hide of the late George M. Patchen. The deceased trotter's rotund exterior suggested the wine-skins of Spain and Syria, and one was half tempted to tap his near fore leg in expectation of a rill of tolerable port. That his sumptuous artillery-harness was but a superficial ornament, and that his real use lay deeper, was a natural conclusion. The men, of course, one could not suppose to be utilized as carriers of wine. The supplies for their interior, fluid and solid, were nevertheless conspicuous on shelves and tables hard by. Goodly rows of preserved fruits and vegetables, meat-biscuits and flour of superlative whiteness, gave cheerful assurance of the excellence of the fare enjoyed by the United States army and navy, and beguiled one into forgetfulness of the combination of jokes and anathemas habitually leveled at the commissary, and of the circumstance that Crook's excursionists to the Black Hills were at that moment dieting on mule-beef eked out with dried berries and grasshopper-curry captured in a Sioux camp. The most perfect administration, however, cannot always identify theory and practice. Not even from Washington City, at this culminant hour of a century of marvels, could we expect that miracle.

Fortunate and happy, too, would be the quartermaster who could trace the every-day working of his department in the faultless array of tents perfect to a pin, of lustrous knapsacks and of rustless horse-shoes of every size and for every kind of road or no road at all; the elaborate veterinary museum and dispensary, and the countless other things he is accustomed to see only at the head dépôts or on his printed forms, and which are sure never to turn up when and where wanted. Quartermasters must have been among the most astonished of the visitors to their special section. Never before did they realize their own riches.

In the naval service — oddly enough, when we consider the comparatively precarious and treacherous character of the element on which it acts — the two factors, what is intended and what is, are better brought together than in the army; and the display could consequently be scanned with more of the satisfaction born of a sense of the real. But the marine arm is the more conservative. It has less to show of the progressive than the other service, the more so as it is at present in a somewhat torpid condition with much old material to work off. Our drydocks are not new, nor their models calculated to suggest new ideas to ob-

servers from either side of the Atlantic. So, to a less extent, with the models of vessels and the marine steam-engines. In the latter field our constructors are said to compare less favorably with their foreign rivals than in engines for use on land. However this may be, the machines exhibited cannot well be surpassed anywhere for beauty and finish. It would have served a good purpose if working models of American engines, and of those of one or two of the latest British ships, could have been shown side by side. In the use of metallic rigging we are behindhand. Cables of steel wire of different thicknesses were shown, surrounded by great coils of hemp and manila cordage, but there was no trace of the employment of iron and steel in many forms common in the principal European navies. In provision for hygiene, however, and for the treatment

VIEW OF SECTION OF FISH EXHIBIT, IN THE UNITED STATES GOVERNMENT BUILDING.

of disease and wounds, the United States navy is honorably prominent. Sections of the sick-bay and of hospital-ships were given in illustration of the attention paid to a branch wherein all the nations can beneficially compete.

Toward the promotion of scientific inquiry the American navy has notoriously done its full share, and we might quote from an address recently made before the British Association by Sir W. Thomson a handsome acknowledgment to that effect, the eminent physicist not forgetting to unite the army and the Smithsonian Institution in his tribute. The voyage of Wilkes's squadron is not less distinguished in the annals of discovery than that of the Beagle a year or two earlier. Similarly, those of Kane and the Polaris dovetail well with the later British and Austrian polar expeditions. Maury, Brookes and Berryman were the pioneers in deep-sea sounding and the mapping of currents and winds; and their work is the basis of what has been since done by European effort. The American share in the transit observations of December, 1874, was in the hands of the navy, and few things in the exhibition were more interesting than the structures and instruments used on that occasion at the eight stations in charge of its officers. Copious illustrations of the outfit of the Washington Observatory, and of results obtained by it, showed that the regular operations of that institution are pushed with a zeal commensurate with that elicited by exceptional and showy occasions like the transit of Venus.

Nothing could more appropriately have found a place in the government building than memorials of Kane and his Arctic associates—knights-errant of the main in pursuit of a Grail as elusive as Arthur's. The peaceful weapons of his assault upon the ice-mailed fortresses which guard the great secret, his armor of furs, the sim-

ple but eloquent trophies he brought back, are relics of as staunch heroism as any shown in battle. By the side of them were placed mementoes of the expeditions of Hayes, Hall and Bradford, with some of Franklin and Parry recovered by those explorers. The famous boat Faith, one of the fleet of three which partly bore him and were partly borne by him over eighty miles of ice and a thousand of sea, is not too much battered to figure, in company with its companion, that built by Buddington from the wreck of the Polaris and used in a like perilous retreat, at the next Centennial.

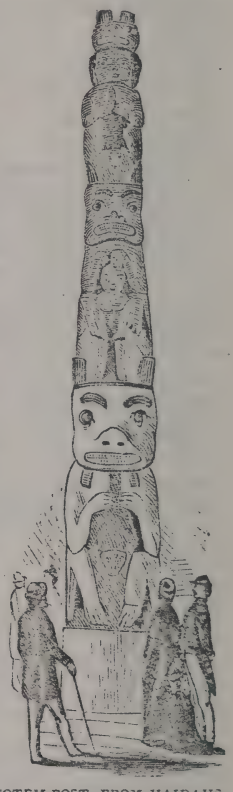
Unlike the armies of Western Europe, ours is restricted in its wanderings to the continent. The colonies it has to defend and the new regions to explore lie within the home domain. That is extensive enough, however, to give its record abundance of the novel, picturesque and instructive. Its first step is to get control of the weather—a conquest achieved by one of its least conspicuous members. The Signal Corps, having no flags to wave or momentous messages to convey in time of peace, was fain to find a new excuse for its continued existence. The clerkship of the weather was vacant, and it stepped into that post. The occupation it has thus made for itself is unknown, on any mentionable scale, to any other signal service. The submarine cables connecting other capitals and head-quarters with distant stations cannot well be utilized for such duty. The wires employed must be capable of synchronous and unbroken transmission, and more numerous than those underlying the great oceans. The London office would find it impracticable to command immediate connection at a fixed moment each day, week after week and month after month, with St. Petersburg, Port Saïd and Jamaica. General Meyer has no such difficulty, although he operates through the lines of private companies and has no power to control them. Portland in Oregon and Portland in Maine, Key West, Brazos and Fort Yuma, for example, report to him directly and regularly. Thus, with a little occasional aid from outside the Union, he is enabled to keep his eye on the atmospheric waves, point "lo, here! and lo, there!" to all the storms, and map the day's weather each morning in advance. Growing accuracy has enabled him to change the modest style of his report from "Probabilities" to "Indications," and make his cant title a misnomer. His apparatus, exhibited in use, embraces self-registering instruments for measuring the temperature, wind, moisture and atmospheric pressure, rain-gauges, presses for printing charts, etc. It is not complicated, but does its work with steadily improving precision. The laws of atmospheric changes promise to yield themselves to this persistent summons, repeated daily across the length and breadth of the United States, and the rest of mankind will not be slow to verify them and apply them on the largest possible stage.

Cognate to the exhibition of the weather-bureau is a series of maps based upon the meteorological observations made at the different army-posts for a series of years, showing the isotherms and the distribution of the rainfalls. These charts inform us at a glance of the average supply of rain in each season of the year in different districts, compared among themselves. In the summer months, for example, the blackness of a dense shower overspreads Florida and the Gulf coast, deepest generally at the water's edge. Casting our eye to the north-west on the same map, we find Colorado nearly cloudless, and California perfectly so, except in a few diminutive spots. On the winter map a moderate shadow rests upon California, and with infinite gradations on the rest of the Union. Such charts, corrected and reissued according to the observations of each successive year, will gradually accumulate to a series showing the secular alterations of climate due to the extension of tillage, clearing or springing up of forests and causes less readily traceable. In their formation will be enlisted more and more the aid not only of the Federal authorities, but of private observers and public institutions.

These surveys of the atmospheric envelope of three millions of square miles,

however valuable and full of promise for the future, made a very inconspicuous figure by the side of the illustrations of zoology, botany and ethnology drawn from the same area. There has not been seen elsewhere so complete an exhibit of the native animals of the continent and its waters. The specimens, too, were in good condition, and preserved all their external characteristics. It was curious to compare the manatee and the walrus, the chief amphibia of North and South; and the Florida crocodile, held to be a distinct species from the alligator, with the inhabitants of a frozen sea fatal to all reptiles. The economic value of our native land-animals, never great except in the fur-regions, becomes less each year, and they concern now only the man of science. A political speculator might, indeed, amuse himself by explaining the disappearance of the wolf before the face of the Anglo-Saxon, while still, after centuries of culture, it maintains its existence in Russia and France, some hundreds of human beings, according to a recent statement, falling victims each year in the great pine forests of the former country to the ferocity of a species identical with the gray wolf of the Alleghanies and the Great Plains. Our hunters deem it despicable game, and keep it constantly on the trot, with no chance to dream of taking the aggressive in the wildest fastnesses, much less to carry off children in broad daylight from village-doors. The fur-seal and the sea-otter continue valuable for peltry, the beaver, on the other hand, declining in both demand and numbers. The former are the frontiersmen of a vast watery province, the wealth of which we could here scan in an infinity of preparations and models representing fishing processes, from the capture of the whale to that of the salmon and its handsome little cousin, the brook-trout.

Extinct forms were not honored by the practical government of a practical people with such thorough elucidation. The exploration and classification of the fossils of the Bad Lands seem to have been made over to Professor Marsh and Doctor Leidy, who have presented European savants with so many new and important forms from that region, unique as a group, and valuable as an accession to the materials for tracing definitely the origin of species. Doubtless, other localities await the explorer, similarly rich in undisturbed series of strata and accompanying organisms; and the envoys from Washington may cap with other missing links Professor Marsh's toothed birds, toothless pterodactyls and stone-inscribed pedigree — longer than a thousand turf-books — of the horse. They have no time to lose in entering upon their archæological heritage, for their Transatlantic rivals are already on the scent of it, and will not be slow in responding to Mr. Huxley's "Hark forward!" That eminent systematizer pronounces the discoveries already made on the head-waters of the Missouri sufficient to remove the evolution theory from the category of hypothesis to that of demonstration. The cases containing General Washington's shorts, Andrew Jackson's swallow-tail and the cartridge-filling machine might have been advantageously devoted to gleanings from that rocky but fruitful harvest-field.



TOTEM-POST, FROM HAIDAHS, QUEEN CHARLOTTE ISLANDS, IN THE UNITED STATES GOVERNMENT BUILDING.

In the accumulation of what we may term surface antiquities there was no shortcoming to complain of. In objects bearing upon the history of the Indians —their habits, origin, traditions and con-

nection with lost American races of a higher plane of civilization — the whole exposition was rich beyond comparison; and the government, as might be expected from its special facilities, contributed its full share. The weapons and implements of the living tribes, of the mound-builders and of the dwellers in the fortified villages of Colorado and Arizona were shown in profusion enough to give the impression that what might remain

METEORITE, IN THE UNITED STATES GOVERNMENT BUILDING.

to be found would not be apt to affect the conclusions now deducible. Sections and plans of the mounds extant on the eastern slope of the Mississippi Valley, including those laid off in the fanciful shapes of alligators, birds, serpents and undecipherable animals, leave little to be told of their formation and of the measure of constructive skill attained by their builders. Yet more minutely presented were the rude rock-castles, now inhabited, where inhabited at all, by the Moquis and Pueblos. These have the air of stranded and shattered relics of a flood that has swept by and left them clinging to the banks. They speak of a condition of chronic war, of a continuous struggle between the savage tribes of the broad and sterile table-lands and a more cultured people who held precarious possession of the narrow alluvions of the rivers. The contest seems finally to have been determined in favor of the *Indios bravos*, as the present frontier Mexicans, who fear the Apaches, Navajos and Camanches as much as did the Aztecs and their outlying provincials, name those marauders. The remnants that ghost-like haunted their ancient homes were rescued only by the intervention, within the past few years, of the northern whites, who have repressed the nomads and secured the tillers a breathing-spell before final absorption by a more resistless current. The relics drawn from the cliff ruins comprise a great variety of objects in terra-cotta, bone, copper, stone and shell, rude matting and cordage. They possess a general Aztec character, which is supported particularly by a circular stone carving like the so-called calendars with which writers on ancient Mexico have long made us familiar. There is a resemblance also to the works of the mound-builders. Neither race, granting them to have been distinct, appears to have been acquainted with iron, or made any but the simplest use of the native copper extracted from outcropping lodes with stone hammers. Shell ornaments indicate a common communication with the sea, and wide ranges of travel are proved by the stone of the arrow-heads, axes, etc., frequently belonging to a locality far distant from that where found. The images are in style and physiognomy wholly Indian, and supply nothing to weaken the conviction that the twin continents, north and south, were peopled by a homogeneous race, and that America had of old its civilized and savage nations of the same blood, not so widely separated in the degree of their intellectual and artistic advancement as were the people of the Mediterranean and the Baltic fifteen centuries ago. Following the trend of the great watershed north-westward to the former isthmus (and now peninsula) of Alaska, we find at the landing- or crossing-place of the first red man his familiar traits of mind and hand, not in the highest stage of development, nor as certainly at their lowest. The close resemblance between the great carvings in timber of the In-

dians of the North-west coast and those in stone of Yucatan and Nicaragua, four thousand miles south, is very striking. The former are only less minute and finished in a more manageable material. The wooden dishes, trays, etc. of the Sitka Indians show what white instruction of the most rudimental kind can do toward improving the aboriginal taste, and monstrous masks like those of the Roman actors, with gigantic canoes hollowed from trunks of trees, exemplify reversions of the native artist to his first love. What may be styled the sacred art of the northwestern tribes shows itself in wooden figures of the bird fabled to have brought

VIEW OF THE INTERIOR OF THE GLASS-WORKS.

their ancestors from Asia. It bears the head of a dog, and may have been borrowed from a fossil, like many nondescript creatures which adorn the heraldry and the legends of more famous races. An archæopteryx, or a flying reptile, of twenty-four feet spread of wing, stamped by the hand of Nature on the face of a Tertiary bluff, would be apt to suggest itself to the untutored savage as having furnished pre-historic transportation across the stretch of water, the obliteration of which by ancient land does not appear, to judge from the bird-tradition, to have been recent enough to fall within the range of his cognition or inference.

The features and skull of the red man are very distinctly marked, but the race has been long enough out of Japan or Kamtschatka to have undergone much variation in this respect, as was evident from the collection of photographs exhibited. The breadth of the cheek-bones and base of the skull in the Camanche, the more compressed and aquiline head of the Sioux, and the comparatively delicate and Caucasian features of the Cherokee, Creek and Choctaw, declare the tribal characters of those groups. The countenance of the Choctaw governor Pytchlynn would make him a man of mark in any intelligent assemblage, and the unquenchable animosity of the Dakotas is not less readily expressed in their faces. Sitting Bull and a long series—past and, it is to be feared, future—of similar bovines become quite realizable. The Modoc visage is more hopeful. Scar-faced Charley might be taken for a clerical friend of ours.

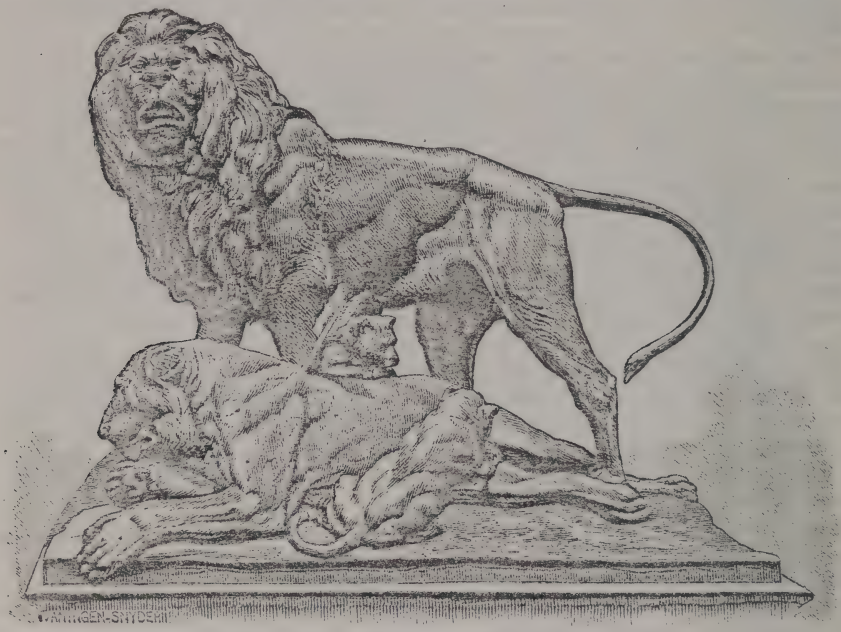
It is odd to see these pet enemies of the country seated calmly in front of school-houses and other such charms of reservation culture to have their pictures

taken. Odder is it to note in the crowd of nominally tamed and trained children the wild and wandering eyes and contracted foreheads that speak of generations of savage life. Their educational varnish is warranted by those who are applying it to stand, and some of them look as though it might, even under the trying conditions it remains for them to encounter. We could not but fancy we saw a future in the pleasant and gentle faces of some young Pawnees. Close by, too, hung a photograph of the Cherokee council-house, a solid brick edifice suggestive of at least two or three successions of copper-colored Ciceros. Tahlequah has held its own as a capital for forty or fifty years, and its statesmen claim to be out of leading-strings. Its foreground, in the picture, is not oppressed by the keen sharp white faces which are over-prominent at the reservation school-houses, and produce a discouraging feeling that things are too much pushed—the running forced as in a race that cannot wait. There are the dusky little ones, however, their schools, their drawings and their exercises. We shall hope that a hundred years hence the interest of the display will not be that only which attaches to the Pequot Bible.

So far, the Plains have afforded the government its one field for non-military education. It appears to think its success in that region justifies the extension of its efforts to a sphere heretofore reserved to the States and private citizens. These naturally and properly took charge of the subject of education in the exposition, and left small cause for surprise that the Federal illustration of it should be so inconsiderable. For medical education an admirable museum and reports on military surgery, model hospitals and their adjuncts, testified the government's ability to do more, but no one expects an interference with our medical colleges on the part of the Washington authorities. The Agricultural Department is also coming down to its bearings, and promises some day to lend valuable aid to the State colleges recently set to work on the most ancient and popular of sciences. It may bring together and collate their conclusions, and busy itself with inquiries of a more general nature than will strictly lie within their purview. Its present activity was amply exemplified by its share in the exhibition. Its admirable displays of grains and seeds, fruits in wax, specimens of soil, fertilizers, skins, leather, liquors, woods, breeds of domestic animals, etc. were in one point or other equaled or surpassed elsewhere on the grounds, and were distinguished chiefly by the breadth of territory from which they were drawn and by the excellence of their preparation and arrangement. Four hundred species of timber trees looked like the representation of a continental forest. The same impression was produced by the collocation of cane-, maple- and beet-sugars, and in a yet greater measure by the mineral ores from different States and Territories, including notably the rich iron ores of Missouri and Michigan. A lofty column of coal cut from a forty-foot seam, springing from a pedestal of marble blocks hung with sheaves of grain from many localities, was an appropriate centre-piece for the building. An assemblage of birds and insects, the former designated as injurious or the reverse to vegetation, interested the farmer from whatever quarter, and we are sure that he was no more astonished than gratified to see how many of his feathered acquaintances were his friends and benefactors, and what a very trifling minority were not. The special functions of the department defined themselves also in the maps intended to compare the condition of every portion of the Union in regard to forests, the production of fruits, textile fabrics and sugar, and the average wages of farm-labor. These charts will gradually become more exact and reliable. The woodland map shows a large preponderance in favor of the Southern States, and gives warning of the rapid dwindling of the Northern forests. Michigan possesses the only considerable body left in the North. The forest-breadth of Oregon is made out to be unexpectedly small. Like the Eastern tracts, it is clad chiefly with the conifers. The hard woods, were they separately indicated,

would tell a more startling story of the havoc wrought by the axe.

The dapper and alert Post-office Department is always showable. Its first ledger on Franklin's foolscap sheet is ever at hand to be posted on the side of a mail-car. Then there are the machines for making envelopes, and others for making postal cards. An invention for making both ends meet in its annual returns is still a desideratum. Were mechanical ingenuity equal to that financial problem, it would be found solved in metal and mahogany somewhere among



"THE DYING LIONESS," BRONZE GROUP, EXHIBITED BY THE FAIRMOUNT PARK ART ASSOCIATION.

the five thousand machines selected from the endless shelves of the Patent Office and carried to Philadelphia as a sketch of the results achieved by our labor-savers since 1836. This sifting of the enormous accumulations of less than half the century in that office is a great aid to mechanical inquiry, and this group of models should not be redistributed on its return. The difference between it and the mass from which it is taken is that between a library of instruction and one of reference. Both are necessities—one for every-day use, and the other for the rarely-recurring needs of the professional man and the specialist.

American invention does not shine so brightly in our lighthouses as its conceded fertility and the demand made upon it by our extensive coast-line and its peculiarities would lead one to expect. For the best forms of lenses — if not for their material, the home-industry represented by the glass-works in operation at the south-west corner of the grounds supplying that — the Treasury Department is indebted to the French. Not so, however, with the lamps or the revolving apparatus. Non-freezing lamps were indispensable in our hard Northern winters, and in clockwork our artificers were at home. Our coast is now better illuminated than any other continuous stretch of the same length. It furnishes examples of most of the known forms of beacon, from the granite tower on Minot's Ledge, as solid as the famous Eddystone, to the airy erections on screw-piles which skirt the shoals of our estuaries. Perhaps the most novel light is the "ice-float

lamp." The fog-horn is another modern aid to the mariner which visitors, upon whose auditory nerves its merits were at stated intervals impressed, are not likely to forget. When we add to such evidence of the Treasury's care for commerce the life-stations extended within hail of each other like a thousand-league cable for the shipwrecked to grasp, we must concede that it has deserved well of the country, notwithstanding its over-addiction, among other extra vocations, to the business of paper-making. The green lights which flash inland from its currency branch are more apt to promote than prevent disaster, and their fading may be contemplated with complacency.

Altogether, that the invention (not patented) thought out by Jefferson at the corner of Seventh and Market streets, Philadelphia, in June, 1776, and improved with new combinations in 1787, has worked tolerably well, the visitor will probably have confessed to himself as he emerged from these three acres of tangible evidence to that effect, even though in picking his way out he may have stumbled unconformably, as geologists say, over a gun-carriage or a pile of shot.

Passing eastward on Belmont Avenue, his steps would have led him, near the opposite extremity of the grounds, to a humble and inconspicuous yet spacious shed, entitled to be called, if not a government building, a building of the government, as illustrating an essential part of the natural endowments of leading members of the federation, the cornerstone of their prosperity as they have been that of the Union. It was assigned the name of Mineral Annex. Its location made it, though the foremost of all the pavilions, the one easiest to overlook. Entering it, one's natural conclusion was that the soil of the United States was chiefly composed of metal, and of coal to smelt it with where the purity was not too great to need smelting. Michigan's immense blocks of native copper, of copper ore yielding five to sixty, and of iron ore sixty-seven per cent., Illinois's galena, Kentucky's cannel coal, Wisconsin's granite, and Pennsylvania's epitome of all kinds of ore-beds and coal-seams, with maps of them, could be studied here with more advantage than in the fragmentary exhibits scattered through other exposition buildings. Associated with the minerals were exhumed remains of another sort—Indian antiquities. The relics from Kentucky and Ohio were well arranged, with the best attempt at chronological sequence the subject and the data would admit. Those of Ohio embraced a tablet in Aztec style found at Cincinnati. The difference between this stone and the Runic-looking inscription—a wax impression of which was placed by its side—taken from a mound seventy feet high at Grave Creek, Virginia, amply explains the perplexity of a generation of antiquarians over the latter. One of the two carvings points to Mexico and the other to Norway, if it points anywhere. To people who were not antiquarians a more obvious wonder was why the race who discovered the copper and made some little use of it did not stumble on a way of reducing the almost equally pure native iron, clear the rich Ohio Valley, and there attain a more advanced development than was reached in Peru or Anahuac. That the higher races of the Old World should have so long failed to detect the power that lay hidden in their deeply-buried and comparatively poor iron-beds is explicable; but iron must sometimes have flowed from the fire at which the Indian roasted his venison. In the far South he actually smelted silver, but the Arizona meteorite exhibited by the Smithsonian Institution supplies the only known trace of a similar attempt on iron, and that had no results. That singular relic, fraught to us with a double mystery, cosmic and earthly, fell before his eyes. It bears some marks of his having put it to the question by fire, but in a feeble way.

—— It spoke to him what kindly Heaven decreed,
But the sealed eyes of savage men were all too blind to read.

Iron appears to be somewhat intractable to an older branch of the Mongol race, if we may judge from specimens shown by the Chinese in this same an-

nex as the latest triumph of the imperial foundries. The Celestials came late with a supplementary collection of furs, seeds, grains, medicines, shoes, musical instruments, glutinous birds'-nests, models of junks, and the other contents of an ordinary Chinese curiosity-shop. It was fortunately excluded from their section in the Main Building, and would better have been remanded to the packing-box. That the people of the rude interior should have sent these things is conceivable, but that they should have been deliberately brought together and forwarded ten thousand miles by the government is discouraging to those who have hopes of China. Japan does not put her worst foot foremost in that way.

NEW ENGLAND LOG-HOUSE.

Not far from the Mineral Annex, and in a position almost as likely to escape attention, was placed another government building which demands especial notice—that of France. Its object was to acquaint us with the condition of engineering and architectural science in that country as exemplified in strictly public works, those executed by the central authority. The French genius for system showed itself in every object—in models, plans and elevations done to scale (usually one-twenty-fifth of the actual dimensions) and colored from reality, even to indicating the different varieties of stone and concrete. Mirrors under some of the bridges aided in displaying their construction, and in other cases the exact conformation of the subaqueous surface was shown, with its character, whether of mud, gravel or rock.

Since 1824 the improvement of the navigation of the lower Seine has been pursued with marked success. The channel through its delta has been straightened and the water concentrated. Good land has been recovered and malaria reduced. Similar works will ere long be pressingly needed on many tideways in this country, and the value of French experience will be felt. Interior canal-navigation, there as here, has been checked by railway extension, but the old lines are kept up, and a revival of the project, partly executed by Louis XIV., of a passage for vessels from the Atlantic to the Mediterranean, is engaging attention. The aqueduct of Roquefavour, on the Durance Canal, near Marseilles, is an extensive work, minutely shown by model. It accommodates a double roadway beneath the canal. In the model of the bridge of St. Sauveur (Pau) we see the process of construction throughout, including the wooden centring of the arch-way. Our constructors are accustomed to pluming themselves on their mastery of timber, but they are not often called on for its use in raising arches of masonry of the magnitude represented in these models. As a rule, small culverts, needing no such formidable preparations in the way of temporary props, mark the limit of their vaulting ambition. Few navigable aqueducts are now built in this country, and for viaducts iron is the preferred material. In France also it is fast

growing in favor. The examples shown of it manifest the traditions of the arch, the multiform balances of thrust and strain in our lattice bridges being less cultivated there. A cylindrical drawbridge at the docks of Brest looked cumbrous in comparison with the corresponding structures so frequent in the United States. It is a general tendency with French as with English engineers to err in the direction of excess of weight and bulk, whether in iron, timber or stone. They build rather than frame. They expect a bridge, like a ship, to carry its own ballast. This may be a result of their more extensive, and formerly exclusive, use of masonry. In that walk they are certainly deserving of careful study. The anatomy of the Pont d'Arcole at Paris, displayed from the bottom of the caisson and the filling of the abutment to the paving of the roadway, was interesting even to the non-professional. So with other models of bridges and of the vast constructions undertaken by France to supply the lack of good harbors on the Channel and the Mediterranean. The artificial harbor at Marseilles exceeds in extent, if not in cost, all the like improvements in American ports put together.

That the republic keeps a keen outlook seaward her elaborate harbors are not the only evidence, to judge from the ample illustrations of her lighthouse system. A map of her coast showed the radial range of each light. The circles often interlap, proving that she lights her side of the Channel as though it were a watery street. The parallel is destroyed by the absence of parallelism in the bounding walls, and by the particularly treacherous nature of the pavement, dotted as it is by rugged rocks and traversed by a labyrinth of currents. The provision made for saving life and property does not strike one as being commensurate with such perils. The appliances for reaching ships in distress with lifeboats, howitzers for throwing lines, etc. have a rude look. We may extend the same remark to the laborers' implements exhibited in the building. Probably this service was not adequately represented.

Maps of the interior of the country were placed elsewhere. A neatly-executed one in this pavilion indicated the deposits of mineral fertilizers found at different points in France. Under so strongly centralized a political system such matters devolve upon the government, with many others more local. Louis Philippe used to complain that he had personally to regulate the water-supply of every miller in the provinces.

The French government is the only one, besides that of the United States, which made a separate and distinct display of its own. And this was, within the scope to which it was limited, finer than can be inferred from our very slight outline of it. It aided us in comprehending a former importation into the United States of engineers from France — the Bernards, Crozets and others — which only ceased when the home-supply sufficed. We turn from her ponderous locks, docks and bridges with a sense that her repute is not likely to decline. As we emerge from the building our eye falls upon the bronze lion-group from Munich, by all odds the finest piece of open-air statuary on the grounds, chosen with great judgment by the Fairmount Park Art Association as a permanent embellishment of them; and we realize the partnership of the nations in every class of work—Germans mastering the subtlest art, and Frenchmen grappling with the most ponderous mechanical tasks. We pass on to another unusual field where the ordinary assignments of labor are somewhat broken in upon. We find woman undertaking, under a roof of her own erection, to run steam-engines and publish newspapers, not neglecting the while her more habitual occupations. In fact, as might be expected, her demonstrations toward the heavier tasks from which civilized man has with one voice exempted her are but half-hearted and resultless. Let us take small note of them, and proceed to glance at employments in which she has always been and will always be at home.

The needle is woman's brush and chisel. What can be done with it she

can do, and man cannot. The world of lace and embroidery is a very pretty—let us say a beautiful—world. Indeterminate and elusive forms upon a texture that beguiles the eye with every degree of the diaphanous are certainly in one sense things of beauty, and none the less so that, like marble, lace discards the aid of color. Embroidery, it may be said, is not so independent, but the colors with which it usually deals are few, and the effect is dependent on simple sharp contrasts and not on gradations and interfusions of harmony. Silver on blue, gold on crimson, etc., are combinations which speak for themselves, and

VIEW OF THE INTERIOR OF THE WOMEN'S PAVILION.

once fixed discharge the decorator from any considerations but those of form and of delicacy in the rendering of it. Beauvais and Arras are not properly embroidery, but mosaic with the needle. They are pictorial, and the work of men. In lace and the finest embroidery men's fingers, even the flexible and slender fingers of Hindoos and Chinese, are at sea. Accordingly, we find no lace factories or lace-schools of boys, and chasuble, stole and altar-cloth are wrought by nuns and not by monks.

Lace has its literature and its enthusiasts, like ceramics. Its styles are many, and each boasts its antiquities and rather disdains improvements. They are conservative in other respects also, and manifest a cat-like devotion to locality. Brussels and Malines, for instance, remain firm in their supremacy, the cellars of Grammont and the flax-fields of Brabant resting unchallenged for material and manipulation. The Honiton is an English offshoot from Belgium, thanks to Alva's expulsion of some of the Flemish lace-workers; but Devonshire is still, or was very lately, dependent on Flanders for handspun thread, British machinery and British fingers remaining unequal to its production even under the incentive of twelve hundred dollars a pound. This family of pillow-laces—block, applique, duchess or guipure—seemed to bear the bell both in the women's show and in the Belgic section of the Main Building. Exquisitely delicate as the fabric is, in some specimens it affects relief, and tiny roses unfold petal on petal and microscopic pistils beneath. Not so with Venice point, an historic lace of pure needlework that is

only the suggestion of a tissue. The "woven wind" of the ancients could not have surpassed it in tenuity, and no expression can better describe it. Belgium led in this form, as well as those more especially her own; but the Sisters of St. Joseph, at St. Augustine, Florida, claimed a place for America. Singularly enough, these ladies have to look far North, over the whole breadth of the Union, to the

DREAMING IOLANTHE, IN BUTTER, IN THE WOMEN'S PAVILION.

convents of Canada, for American rivals in the finest department of needlework. The repose of such institutions is favorable to an art that demands, above all, patience. The nerves of our women are keyed to too high a tension for such an occupation. They can appreciate its results, however, and might be seen during the exhibition contemplating a strip marked four hundred dollars a yard with a calm indifference to the inscription in which their lords were unable to participate.

In embroidery American women reappeared in another character than that of purchasers. Boston sent some fine embossed work. Green Erin was also heard from through county Antrim. Norway and Sweden were quite profuse in their display, the former strongest in the finer work, and the latter resting her cause on rugs, mats, etc., which struck us as far ruder in style than efforts of the same nation in other walks. The English Royal School of Needlework likewise excelled more in quantity than quality, the designs being stiff and meagre. It was quite outdone by the municipal school for girls of far-off Manila, whose embroidery on cloth made of the fibre of the pineapple and in gold thread on more substantial fabrics was noticeable both for taste and execution. Japan was also strong in silk and gold, and remarkable for some bizarreries in the way of solid or raised objects. The Japanese productions had the merit, not over-common in this class of articles, of being moderate in price.

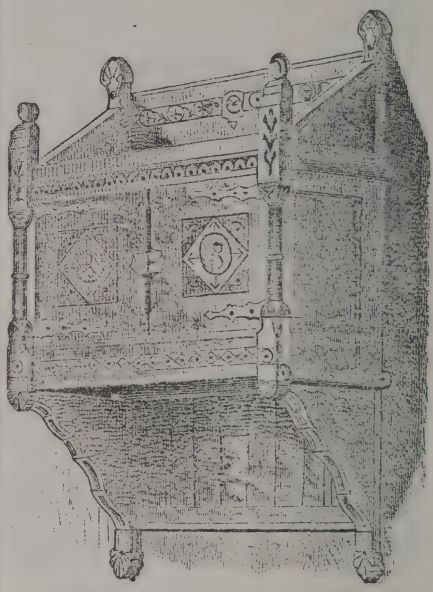
We find that this is leading us into the vast, snowy and flowery realm of Berlin wool, which covers so large a part of the female territory. It is to be carefully avoided. So are the ribbon and other looms, rough affairs indeed as compared with those in Machinery Hall. The telegraph ticked away comfortably under the feminine touch: *The New Century* newspaper proved more innocuous than might have been inferred from its somewhat alarming title, and the *National Cookery Book* assured us that a good old calling was not to be wholly neglected in these days of progress. Seventy-four models of inventions by women consisted largely of aids to domestic and personal comfort, the most solid among those not having such a purpose being an artificial stone or building composition. Into the New England log-house, an appendage of the Women's Pavilion, neither building-stone nor invention of any kind was admitted. Old-fashioned ways and means were in it sheltered by unhewn trunks from the forest; yet its cozy interior was not calculated to impress one with the idea that our grandmothers were objects of just pity to their progressive descendants of the same sex. Its broad-breasted hospitable fireplace had more glow and life in it than all the modern stoves on the ground put together, and the ample dresser was eloquent of those first essentials of domestic happiness—neatness and order.

In art the coloring of photographs and the decoration of small pieces of porcelain were, if we exclude sculpture in butter, the only branches that looked like acknowledging female monopoly. Memorial Hall contained far better pictures by wo-

men than were here to be found. Eliza Greatorex's drawings and etchings would have been better with more decision in form and outline. Promising designs for carpeting, tiles and rugs, paintings on porcelain, and similar art-works came from the Free Industrial Evening School of Lowell, the Massachusetts Normal Art School and Institute of Technology, and the Design School of the Cincinnati University. The prices affixed to the porcelain seemed to be high, but there must be a beginning, and the capacity for the work is the point to be established. The question of a market comes after. The same remarks will apply to the ample and attractive collection of wood-carvings from the Cincinnati School. The work in these, as a rule, adheres too closely to the surface, as though afraid to launch out into bold relief and a proper development of the design. They exactly reverse, in this respect, the Japanese bronzes. There is no under-cutting, and the effect is more that of etching than of carving proper. It has the air of a dallying with art, or at best a sketching of what will never be finished, and is not by those employed on it expected to be finished. Young women will not look, as young men do, on any kind of technical training as providing them a lifelong occupation and means of existence. Hence an incompleteness in what they accomplish which needs no arguments drawn from woman's alleged lack of mental or manual force to explain.

In the Pennsylvania Educational Building the artistic efforts of the Girard College pupils and of those of other male schools appeared to us inferior to the productions of the Philadelphia School of Design for Women. We have before remarked upon the exceptional merit of corresponding works from the Swedish female schools. It will probably be found that this superiority with the pencil of girls over lads up to the age say of eighteen is a general thing. And the remark might be extended to other branches. The aptitudes of the female mind should be taken hold of and their development pressed at the earliest age possible. While industrial schools for *women* will help to supply many a new means of support and occupation, the highest results can only be expected from earlier training.

In the transient features of the exhibition the international idea could not of course be so readily adhered to as in the permanent ones. A running fire of



CABINET IN THE WOMEN'S PAVILION.

secondary demonstrations opened with strawberries and closed with turkeys. Not that the spread was by any means confined to edibles, or any other subject which America would perforce have mostly to herself. Divers assemblages of uniformed militia contributed what of charm remained in drum and fife; the benevolent orders and the butchers threw in what they knew of pageantry; "horses, mules and asses" followed in early September, with an addendum of dogs; horned cattle, more respectfully distant from the knights of the cleaver, summoned their stately cohorts *vasto cum gemitu;* the feebler folk of the farm, swine, sheep and goats, added their treble to the tumult; sorties of reapers, steam-ploughs and harvesters bore the spirit of the hurlyburly into

the quiet Pennsylvania fields; regattas brought out the rival brawn of the different English-speaking families; the rifle, also in the same hands and no others, added its expressive tones to the plash of the oar; and conversaziones much more varied in vernacular discussed medicine, general science and education with results yet in embryo. A series of statues and groups of statuary furnished by their dedication occasions of parade which were not neglected. Worthy of especial notice among these monuments is the colossal marble figure of Columbus presented to the city of Philadelphia by Italian citizens, and dedicated on the 12th of October, the anniversary of the landing of 1492. The statue, ten feet high and raised on a pedestal twelve feet from the ground, has little of novelty in treatment. The subject, indeed, leaves small room for that, the shape and features of the world-seeking Genoese having become stereotyped like those of Shakespeare, and laid away in the popular mind as things never more to be trifled with by fancy. The Spaniards claim him in the decorations of their pavilion, as in the couplet on his tomb, for Castile; but this protest from Carrara is in harmony with the papal assertion in the partition of the Western hemisphere between the two Peninsular powers, that the New World, like the Old, was the birthright of Italy. Her attorney merely made Spain a stopping-place in the voyage to his patrimonial domain.

The Schuylkill regattas—to descend from the Pinta to a race-boat—attracted no such attendance as that which lined the Thames on a previous international contest. The sensation in the present instance was not concentrated on the event of a single day. The rowing, preparatory and decisive, occupied the afternoons of a fortnight, but still the combined attendance of all the days would not have equaled that of the London affair. Our people have not quite the British passion for muscular competition, and the lusty oarsmen and the lovely river had too powerful a rival on the heights beyond. Among the participants themselves there was no want of interest, as the closeness of the struggle and the hair-splitting debates over the rights and wrongs of the awards sufficiently proved. "Fouls" are no concern of ours, and it is enough to say that in the main race one of the two United States fours beat the London crew by a few seconds; that the countrymen of Sam Slick in a match with the Londoners came off victors actually, although a technical claim gave the prize to the latter; and that in the minor affairs Fortune changed her colors too often to admit the waving of her favorite flag.

Not so with the rifle. Around that historic implement she wreathed the Stars and Stripes. The meteor-flag, however, was not on the field, Scotland, Ireland, Australia and Canada doing battle for the empire, the English "team" having been kept at home by a point of etiquette which was more discernible in their atmosphere than in ours, if we can judge by the statements of professionals. Had the British National Rifle Association entered the lists, it could hardly have changed the practical result greatly, the 3126 of the American team out of a possible 3600, against 3104 for the Irish, 3062 each for the Scotch and Australians, and 2923 for the Canadians, leaving no margin for a very decided triumph either way. The scores are so close together as to bring marksmanship at long range under the head of machinery. Equally well matched did the American and Irish show themselves in subsequently scoring 1165 and 1154 respectively. The international rifle trophy, thus kept at home for at least its first year, is somewhat novel in design and material. It is over seven feet high, of wrought iron inlaid with gold, silver and copper—the eagle of copper and his lightning shafts of silver. Nine silver laurel wreaths, eight of them to be filled with the names of the victors from 1877 to 1884 inclusive, depend from a chain attached to either end of the Roman fasces. A rifle would have been less of an anachronism than that ancient emblem, but such incongruities cannot well be avoided in an age with so little symbolical furniture of its own.

The rifle-shooting was not the less a

part of the Centennial programme for having been held at Creedmoor. Nor, to compare great things with small, was the Fourth of July ceremonial for coming off at Independence Hall. Historical houses and associations cannot be carted about, or they too would have found their way to Fairmount Park. The original Declaration stayed with the bricks which first echoed it, and again informed a heterogeneous crowd that they and "all men were born free and equal." Glittering generalities often have an immense deal of solid value. A faith and a fetich —let the two harmonize or not—are a necessity in politics as in religion. How many Englishmen know anything but the name about Magna Charta, and who ever saw the British constitution? The moment of highest enthusiasm with the crowd in Independence Square last July was when they saw the yellow parchment. They did not listen to the reading of it, or to Mr. Evarts's oration. The first heat of the appointed race had been worried through — time, one hundred years—and there was the starting-point, now the winning-post. How it was inscribed, and who the judges were or what they were saying, was matter of small consequence.

Another formality of the great Fourth, well conceived and better carried out than could reasonably have been expected, was the procession of writers, each with his historical monograph. In that mass of new manuscript there must be some new matter, and many of those whose pens were engaged were thoroughly capable of judging what was really new. The country is not old enough yet for good history, or even good biography. The historian of his own country must be born of a gestation of two or three centuries. But we can accumulate materials and practice casting and recasting them. Let them be published, if worth it, for what they are, and not for judicial summaries, which will not soon be possible. Piles of brick and mortar are not sightly, but they are indispensable. The architect will come after a while, and the edifice spring into being. It may not be a marvel of the art, either; for great historians are about as rare as great poets, and the popular recognition and acceptance of them is by no means as warm and unanimous. The highest intelligence, the most unwearied research and the most vivid powers of narration cannot enable the describer of a nation and its acts and fortunes to avoid an unpleasant jostling of prepossessions, and to wrap himself without challenge in the judicial robes.

We may term the States' days subsidiary Fourths, although Virginia's constitution as an independent commonwealth was framed and adopted by a convention which met on the 6th of May, 1776, and thus antedates the Declaration. The natal days of the rest of the Old Thirteen are scattered over that year and several following, Rhode Island having postponed her new birth for three generations; meanwhile doing republican business under Charles II.'s charter. The rest of the thirty-eight were necessarily without place in the Centennial calendar. No relation could therefore be fixed between the States and any particular day between May and November. The days arbitrarily selected were not used in a way to give the proceedings any significance beyond what attaches to a social reunion without their borders of the people of a State, or such portion of them as had the spirit and means to go abroad and enjoy it. New York made the twenty-first of September a white day in the financial annals of the exhibition, 118,719 paying visitors entering the grounds and 3284 the cattle-enclosure. Adding 12,421 free admissions of exhibitors, officers, waiters and the press, the entire attendance was brought up to 134,588. Sixty thousand dollars were added to the treasury of the Commission, and the shareholders were cheered by the results of a week averaging over a hundred thousand daily admissions. Their expectations rose still higher when on the 28th Pennsylvania gathered within walls mainly of her own building two hundred and seventy thousand persons, 257,169 of them "cash admissions"—doubtless the greatest number on record as having entered on a single

day a public exhibition not free to all. The receipts from admissions up to the 1st of October already largely excelled the whole season's income of either of the great European exhibitions except the first, and equaled that. The sum was $2,210,263 from 4,750,000 visitors. The whole amount taken in at London in 1851 was £506,100, and in 1862, £408,530; at Paris in 1855, £128,099, and in 1867, £420,735; and at Vienna in 1873, only £206,477. The amount taken in at the gates is not an exact guide to the numbers contributing it. The average cost

OBVERSE. REVERSE.

CENTENNIAL AWARD MEDAL.

to each visitor was greater at the exposition just closed than at either of the others named. At Paris, in 1867, 8,805,969 visitors paid $2,203,675. Trials made at Philadelphia of half-rates to schools, and to all comers on certain Saturdays, proved that a reduction would have been hurtful to the finances of the exposition, and would have had no compensating effect in the way of attracting intelligent and appreciative visitors. An aggregate attendance, in the 159 week-days between opening and closing, of 8,004,214, exclusive of the free list, yielded a revenue of $3,813,694. Add receipts from rents, privileges, commissions on sales and some minor sources, and the whole income does not vary much from $4,300,000. This sufficed, after deducting the daily expenses during the season, to cover a large percentage of the stock-subscriptions. There remain, in addition, permanent edifices, statuary, bridges and improvements of the grounds, including Memorial Hall, Horticultural Hall and several of the best of the State and government buildings. This is a better outcome, on the Gradgrind basis of dollars and cents, than had been attained before save in 1851. The Kensington Art Museum and School, representing the clear money-profit of England's first venture in the show-business, is more than matched by the solid mementoes we have cited and by the Pennsylvania Museum and School of Industrial Art,' although these are accompaniments rather than direct financial results, the State, city and private citizens having furnished their cost. The new Pennsylvania Museum made large purchases from among the art-exhibits, and owed other acquisitions to the liberality of foreign exhibitors and commissioners.

The century has indeed stamped its parting footprint deep upon Belmont Avenue. But not in monuments of bronze, iron, stone and glass, nor in sheets of colossal arithmetic, did the exhibition leave its broadest and best traces. Any movement which assembles from distant quarters seven or eight millions of people must have other results than those perceptible at the time or on the spot—results slow to shape and to declare themselves. Observers have to think out, and

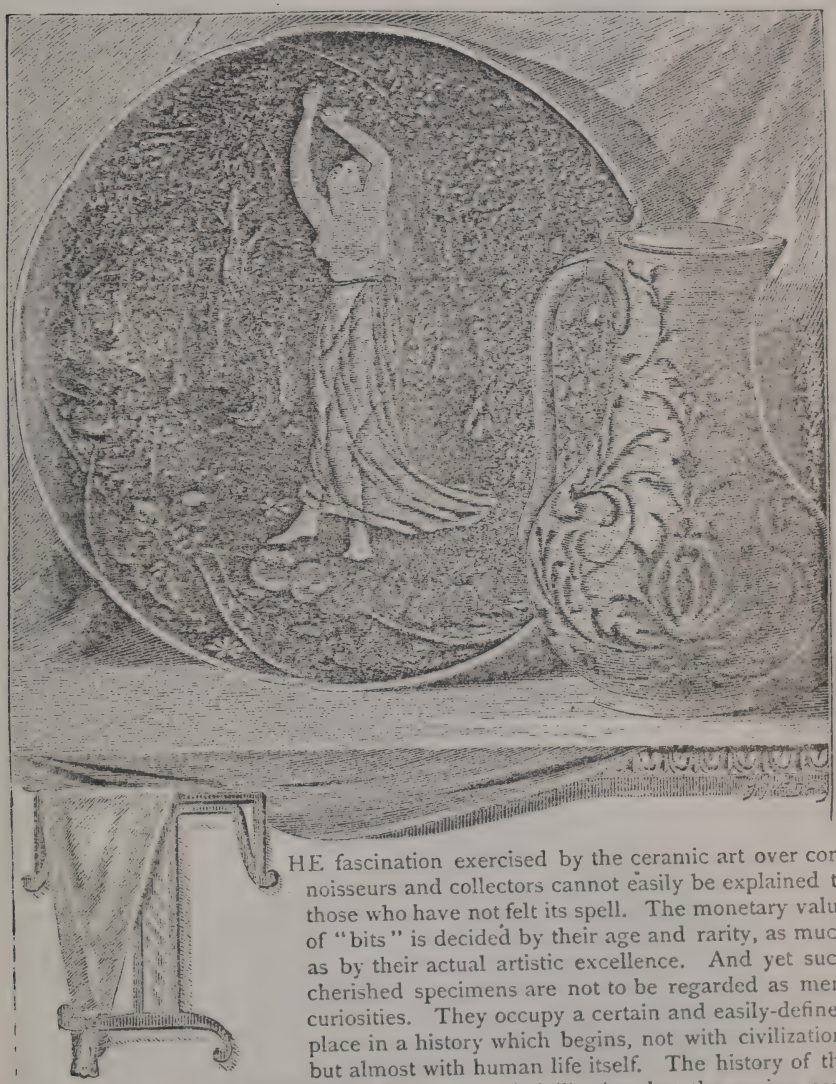
the practical among them to work out, their impressions. Eyes accustomed to a short visual radius will not at once adapt themselves to a longer focus. To apprehend the ideas and the position of other countries than our own in regard to education, manufactures and art we do not, it is true, have to learn their language, but we have to change our mental standpoint and rub out some prepossessions. We have, as it were, to stand outside of ourselves — a process not to be gone through with in a stroll of a few hours through acres of novelties. Operatives, it is notorious, get wedded to their tools, and often refuse to use others which they know and confess to be better. So it is, in a less degree, with their chiefs, master-workmen and leaders in every vocation. The means with which they have achieved all their success seem to them the best means, and they are in a greater or less degree loath to adopt others. That this caution is a good trait is certain. It is at the same time equally true that the nation possessing most of a class fond of experiment and not afraid of innovation will gain most by these competitive displays.

One gratifying conclusion which will, we think, have been drawn by many from what they saw is, that modern civilization has a broader foundation, and more roots to brace and feed it, than it is common to suppose. A greater equality is apparent in objects, ability and accomplishment among the nations. The favorite purposes of all are more nearly identical. The better and more universal instruction of children, the simplification of law, sanitary improvement, multiplying of industries, extension of intercommunication and elevation of popular taste are common aims everywhere in Christendom. Small and half-forgotten nations vie in them with the most powerful. This is all less striking than the indications of capacity for both the solid and the decorative in art, of progress in their cultivation, and of activity in the pursuit of some branches of literature and science, on the part of peoples from whom nothing of the kind was looked for. These small and scattered flashes of power and life go to prove the universality of the movement of the day. Hidden forces for good showed themselves abruptly a hundred years ago. The opening of another century is cheered by another such outburst.

At the announcement, on the evening of the 27th of September, of twelve thousand of the awards made by the two hundred and fifty judges, the addresses of the director-general dwelt upon the "impartiality, fairness and earnestness which pervaded their work." This important labor was executed with a thoroughness that does not appear to have been equaled at previous expositions. The medals and diplomas themselves are but guide-posts to the real judgments rendered. These are contained in written reports, which will be of real value to those on whom they are bestowed, and instructive to others, because discriminating. The jury not only renders its verdict, and sustains it on being polled, but it renders in black and white its reasons. In proportion to the success reached in the performance of this critical task must have been the patience, self-control and good feeling of the jurors. In this they reflected the spirit which really seems to have governed the whole affair and its supporters at home and abroad, from its conception three years ago to the closing hour. Jealousies and obstacles were encountered only to be smothered. A thousand rivalries were weighed, judged and dismissed. The governments and their people were all kindly, and as a rule did more than was asked of them. The Century and its Festival closed in peace.

CERAMIC ART AT THE EXHIBITION.

By JENNIE J. YOUNG.



THE fascination exercised by the ceramic art over connoisseurs and collectors cannot easily be explained to those who have not felt its spell. The monetary value of "bits" is decided by their age and rarity, as much as by their actual artistic excellence. And yet such cherished specimens are not to be regarded as mere curiosities. They occupy a certain and easily-defined place in a history which begins, not with civilization, but almost with human life itself. The history of the ceramic art has been well said to be the history of civilization, but the saying conveys only a partial truth. In the first place, it existed before there was any such thing as that which we now call civilization; and in the second, discoveries were made, and the art was long ago practiced in forms, which we can now only follow at a distance. We see that in painting those who are reverentially styled the "old masters" are still held up as examples or models for the young artist striving toward

perfection; and it is so in ceramics. Age in many cases not only confers dignity, but is the brand of excellence. The art has its secrets, which no more than literary ability can be handed down to successors. In the one case the writer can impart his knowledge by multiplying books, but he cannot bequeath the creative brain. In the other the forms may be transmitted to posterity, but the secret of their production, involving as it does the skill and taste of the producer, is inalienable. A knowledge of its mechanical process may be acquired, but the artistic faculty is attainable in none of the schools. Even the former is not at the command of every inquirer. The jealousy with which the purely mechanical secrets of the ceramic art have been guarded has helped to bring about those partial retrogressions with which we are constantly confronted in its history. It also causes the wide separation everywhere visible in both methods and results between nations and individual manufacturers.

To the connoisseur, therefore, the beauty either of color or shape presented by any piece of pottery is not, by any means, the only thing it offers for his consideration. Whenever a name has been won by the attainment of excellence, imitation begins, and an intimate knowledge and thorough initiation in the mysteries of the art are frequently required to detect in a supposed original only a clever imitation. A cognate inquiry is the effect of one school upon another, and of one country upon another. We are here led into the wide field of historical inquiry, in which is unquestionably to be found one of the most subtle attractions offered by the ceramic art to those who study it. We shall hereafter refer to one or two instances of the historical interest of pottery.

Meanwhile, as to the origin of the art little is absolutely known. It may have had one common source or many independent sources. The probabilities are all in favor of the latter supposition. Nations far apart from each other have existed, reached their prime and passed away, leaving behind them few traces except those to be found in specimens of the potter's skill. These have nothing in common except the material out of which they are made. Moulding in clay appears to have been universally practiced, but the veil which antiquity has thrown over its beginning is impenetrable. Language and legend have only led to greater mystification. By the nations of antiquity all unknown beginnings are ascribed to the gods. Num the Creator, said the Egyptians, made the first man out of the clay of the Nile, and so instituted the potter's art. The resemblance between this and the Hebraic account of creation is apparent. The Japanese found a pre-historical inventor in the person of Oosei-tsumi, and the Greeks also reverted to the dim twilight between the mythological and historical ages to find an origin for the art which they brought to such perfection. To the legend of *Keramos* we owe our word "ceramic," though we speak of the ceramic art as practiced by the Chinese and Egyptians ages before the period in which the heroes of Greece are supposed to have lived. Such legends indicate simply the venerable antiquity of the practice of moulding in clay, and that which was a problem to the constructors of the theogonies of Egypt and Greece remains unsolved to-day. The present point to which the plastic art has risen from its hidden fountain in the past can be defined with tolerable clearness from the display of ceramics at the Centennial Exhibition. Many celebrated factories are no doubt unrepresented, but enough is shown to make the earthenware and porcelain exhibits among the most interesting and instructive in the Great Fair.

It may be regretted that in some sections, notably, the Egyptian and Chinese, the exhibition is not looked at more from the art point of view, and less from that of commerce. It appears somewhat singular, for instance, that Egypt, which has supplied the world with the most ancient specimens of earthenware, dating probably two or three thousand years before the Christian era, should be unrepresented except by a few unglazed vases and pitchers gaudily ornamented with red, yellow and blue painting. Some

FRENCH MEMORIAL VASE.

are quaint in design, and show neither in manufacture nor ornament any skill or taste. We cannot, therefore, trace the progress of Egyptian art. The exhibition is not, in fact, a museum, and we must be content with glancing at such examples as each nation contributes, and drawing comparisons as far as we can

with safety. The fact may, to prevent disappointment on the part of curio-hunters, be thus broadly stated—that the art displayed at the exhibition is the art of our own time.

Another point to be noticed is, that much of both the pleasure and instruction to be derived from the study of ceramics in the exhibition will depend upon the spirit in which we enter into it. Critics have an unfortunate tendency toward setting up a standard of their own, and

FRENCH PORCELAIN VASES.

insisting upon trying everything by it. In criticising a book the reviewer must take his view from the inside outward, and it is just as necessary for the ceramic art-critic to follow the same course. He must first get into sympathy with the artist before he can competently judge his work. The thought may often be commended when the language in which it is expressed is inelegant or obscure. The artist's object may often be praised when his accomplishment falls far short of the perfection at which he aims.

A brief explanation may first be given of the few technical terms to be hereafter used. The terms *faïence* and *majolica* are employed indiscriminately to describe glazed earthenware. The former word is derived from Faenza in Northern Italy, which about the end of the fifteenth or beginning of the sixteenth century was famous for that kind of ware which is often spoken of as Faentine majolica. The latter word is generally understood to be derived from Majorca, but Jacquemart says emphatically that "we must give up seeing in the importation of Hispano-Moresque wares from Majorca the first idea of Italian pottery and the origin of its name." Notwithstanding his authoritative dictum, the evidence on the other side is tolerably conclusive, in so

far at least as the name is concerned. Majorca was by some old writers called Majolica. The ware now known by that name was first produced in Italy in the fifteenth century. Its Moorish origin is almost unquestionable. The intercourse between the Balearic Islands and Italy is well authenticated, and although the first samples of the ware may have come to Italy through a different channel, the probability of the name being thus derived is in no degree lessened. It seems

DIANA VASE IN LIMOGES FAÏENCE.

probable enough that the Italians may have derived some valuable ideas from the Saracens who settled in Sicily, but since the special ware which the Italian potters attempted to imitate was extensively made in Majorca, nothing is more natural than that the name "majolica" should have been ultimately applied to all ware of the same kind, whatever its immediate source and whatever the date of its importation. Down to the middle of the sixteenth century only the lustred

ware was called majolica. Since that period, and in spite of considerable opposition, its application has become as broad as that of faïence, which may be best translated by the English word "pottery."

The latter is a derivative from the Latin *potum*, a "drinking vessel," probably through the French *poterie*, although in France it is applied to drinking vessels of all kinds of material, and is not restricted to those of clay. The nomenclature of the art is, as we have seen, very unfortunate, and further instances of this fact present themselves at every point. There is no agreement among writers, no technological system to which they all conform. Some attempt to draw a distinction between pottery and porcelain: others treat of all kinds of ware as pottery. To illustrate the difficulty of the former course the Egyptian porcelain may be instanced. Properly speaking, the Egyptians never reached the production of a true porcelain. We can find samples of what is called "porcelaine d'Égypte" in the small bluish or greenish figures or images of that country, but, although it is extremely hard, the ware has none of the transparency of real porcelain. On the whole, the French technology appears to be the most lucid. Under it pottery is divided into hard paste and soft paste, the former consisting of five orders, and the latter of four. Taking the soft first, there is the unglazed clay; the lustrous, with a glaze of silex and alkali and metallic color; the glazed, with plumbiferous, clear and thick glaze; and the enameled. Hard paste is subdivisible into the opaque and translucent. The opaque consists of two orders, the fine earthenware and the stoneware. The translucent consists of hard porcelain; natural soft, or English porcelain; and artificial soft, or French porcelain. The translucent hard-paste pottery, or porcelain, differs from the other classes in several respects. Its composition is such that when broken the edge will show the same shining material as the surface. One portion of the compound is infusible. This is called *kaolin*. The other, called *petuntse*, vitrifies at great heat, and envelops the other. From the combination thus effected comes porcelain.

The oldest porcelain of which we have any knowledge is that of the Chinese. It is recorded in their official annals that two thousand six hundred and ninety-eight years before the Christian era Hoang-Ti invented pottery. Porcelain was not produced until about eighteen hundred years ago. Specimens of this ware reached Europe in 1518, whither it was taken by the Portuguese. It was introduced into Egypt and Persia at a much earlier period. When the Portuguese were driven out, their place was taken by the Dutch, and an extensive trade was maintained; but it was not until the beginning of the last century (in 1710) that porcelain was first made in Europe. The pieces imported from China acted no doubt as incentives to imitation, but chemical analysis for nearly two hundred years failed in laying bare the secret of the Celestial workmen. The mystery was at length solved by John Frederick Böttcher, and the first hard porcelain of European manufacture was made by him at Dresden. The story of the discovery is singular. Böttcher's first experiments were unsuccessful. He had not the right material. One day John Schnorr, a wealthy merchant, was riding out near Aue. His horse's feet stuck so frequently in the clay that his attention was called to it. He examined the soft white earth, and the brilliant thought struck him of adding to his wealth by substituting it for flour in the composition of hair-powder. He made the experiment, and was successful. Böttcher was among those who powdered, and finding the powder heavy, he made investigations, and the result was the discovery of the kaolin which was necessary for the production of white porcelain.

Thus prepared, we enter the exhibition. Naturally, we first turn to Egypt. To it belongs the oldest pottery which has been discovered. The antique is not strongly represented. The Egypt we visit is that of the nineteenth century, and not that of the Pyramids. For one small vase a reasonable antiquity is claimed. It is of pale-green porcelain,

or of the ware, halfway between stoneware and porcelain, which goes under the name of the latter. Nearly all the modern productions are painted upon the bare surface, and are unglazed. Some are of the long-necked, oviform shape which is often met with among ancient pieces. The painting is as a rule inartistic and the colors gaudy. More interesting are the small sepulchral porcelain images and scarabæi with hieroglyphic inscriptions. The former are green, and have all the hardness of Egyptian porcelain. They will,

PORCELAIN DINNER-PLATE REPRESENTING A STORM, AND FAÏENCE VASE, LIMOGES.

however, be regarded rather as curiosities than as samples of the ancient ceramic art of Egypt.

We next turn to China, the birthplace of the art of making porcelain. If we take the exhibit as a whole, we should say that it furnishes an abundant supply of peculiarities of workmanship. Many of the vases are far more curious than beautiful. The specimens of crackle, or *tsoui-khi-yao*, are very numerous, and form the leading and most attractive feature of the section. It is not for us to inquire by what distortion of taste the Chinese came to look upon a network of cracks as an ornament. It is sufficient to know that collectors seize eagerly upon any good specimen. The cause of the cracks is the uneven expansion of the glaze. When the piece is withdrawn

from the furnace it is plunged into water, by which the cracks are made, or the glaze may be mixed with steatite, which causes it to crack when placed under the action of heat. Colors are then filled into the fissures. What makes us look upon crackle with greater interest is the fact that the cracks can be made large or small with absolute precision and certainty. One of the specimens at the exhibition is cracked both inside and outside, and is of a grayish-blue color. Two vases sent from Shanghai are in two colors, white and light brown, with lions' heads holding rings for handles, such as are found on many of the most ancient pieces. Another of a different shade has raised blue ornamentation. Two very beautiful vases are pale blue in color, and have white flowers and birds and gold-and-green lizards for ornamentation. An elaborate decoration with Chinese figures is also to be found upon a piece of Kiang-Si crackle. We are impressed everywhere, however, by the fact to which we have already alluded, that the evidences of laborious manipulation and the mysteries surrounding some of the processes of manufacture add greatly to the interest with which we view the ceramic exhibits of China.

It has been the custom to speak slightingly of Japan as dependent upon Chinese teaching. There can be no doubt that to China it owed its first knowledge of at least the higher branches of ceramic art. Passing over the legend to which reference has already been made, it is said that in the sixth century a Corean crossed to Japan and taught the manufacture of tiles. In the thirteenth century Kato Shirozayemon acquired in China a sufficient knowledge of the making of porcelain to start the manufacture in Owari. In the sixteenth century another native brought from China further information, and settled in Hizen. We thus see that Japan derived her first knowledge of porcelain from China. If we are to be guided by the displays at the exhibition, we must conclude that the pupil has surpassed the teacher. It must be remembered, however, that by reason of the enlightened policy adopted by the Japanese government the manufacturers of that country enjoyed special facilities for making a display which would be creditable to themselves. Without making any comparisons of artistic ability, therefore, it may be said that the Japanese display of ceramics shows greater wealth of form and design than any other in the building. Arita-ware is shown in many forms. A pair of large vases with blue ornamentation are among the most valuable specimens, and are regarded, chiefly from the great difficulty of obtaining the color, as triumphs of art. A charming set of three pieces comes from the same district. The vases are small and oviform, and are of a very delicate blue tint. The handles consist of white dragons. The centre-piece is more rotund, and in all the neck is short and the mouth wide. Nothing more exquisite or more indicative of refined taste is to be found in the entire section. Owari, which has for six hundred years been one of the centres of the potter's art, is represented by a variety of vases of deep blue and green, with rich floral decoration. A very remarkable sample of Japanese lacquer-work applied to porcelain is to be found in the Chinese section. The lacquer is laid on in such a way as to leave the figures on the porcelain disclosed, and the lacquer itself is further ornamented by animal figures. There are several collections of ancient pieces both in earthenware and porcelain, so that ample opportunities are afforded of studying the progress of Japanese art. The names of the vases are taken from the towns where the trade is carried on or from the town or province of manufacture. With one observation we leave the realm of the Mikado. Jacquemart treats very gloomily of Japan. He speaks of its being dead in point of art, and so completely under European domination that there is no longer any independent native taste. A glance round the section convinces us that this is an error. The Japanese did for some time study too closely the question of how they could best comply with the demands and suit the tastes of European customers. But the reaction has now set in, and the dem-

onstration of its reality is before us. The imitation of the European has been to a great extent abandoned, and the native taste is again asserting itself.

Among European exhibits one of the features that incidentally strike us is the evident influence of Greek taste and Greek forms. In the terra-cotta of Denmark, Sweden and Austria not only are the shapes Greek, but they are decorated with subjects taken from Greek history or legend. If this fact should be taken as showing a lack of originality on the part of the potters of these countries, it also shows the value of the contributions of Greece to universal art. The best of the Brazilian exhibits belong to the same category. Some of the vases are red with light-brown figures, faces or medals, and others have the colors reversed. In

PSYCHE, IN BLUE PÂTE TENDRE.

point of variety of form and color-combinations the Danish section is most interesting to the admirer of terra-cotta.

Any number of samples of the same material in its many different forms of house and garden ornament may be found in the Doulton group in the British section, or in that of Italy. The former exhibit is particularly noteworthy from the combination it presents of terra-cotta with stoneware ornaments. The latter goes under the name of "Doulton ware," and is applied by Mr. George Tinworth in high relief to the terra-cotta. A pulpit and pavilion decorated in this way by Mr. Tinworth are to be classed among the most striking ceramic objects in the exhibition.

It will be essential in passing from one country to another to keep in view what has been said about majolica and faïence, as the technological confusion threatens to become in course of time inextricable. Mr. Doulton has, for example, given the name of "Lambeth faïence" to a ware which he describes as "a kind of porcelain." We may begin with Italy for a double reason. We there find examples of the metallic-lustred ware which comes most nearly to the real majolica of three hundred years ago, and we have an opportunity in the Castellani collection in Memorial Hall of examining the ancient wares themselves. In the section devoted to artistic ceramics in the Main Building is a large majolica plaque from Faenza, and several others showing landscapes and figures, all of which possess great artistic excellence. The drawing as a rule is free and the coloring true and effective. A fireplace of majolica illustrates admirably the lustrous qualities of that ware. Robbia-ware is represented by a figure of St. John and a toilet-table. To Luca della Robbia is attributed the first application in Italy of stanniferous or tin enamel to terra-cotta. He was born in 1400 and died in 1481, and although his art was carried on by several of his successors, none of them attained to the skill and style of the master. The colors which he chiefly used were white and blue, the former for figures, the latter for the ground. In the Castellani

collection is a bas-relief by Robbia of the infant Saviour with the Virgin kneeling before him, and the Father, Holy Ghost and angels looking down upon the scene. In it the figures are white, the ground blue, and green is introduced in the grass. We can similarly pass from the Faenza-ware in the Main Building to that of the period when that town was in the height of its fame. One of the Faenza vases is oviform, with winged satyrs as handles. The coloring is black and yellow. A piece in the Castellani collection is dated 1521, and may be accepted as a good specimen of Faenza majolica. Many years before that date Faenza majolica was widely famed, and Piccolpasso in 1548 preferred it to the best productions of Gubbio. We linger among these treasures of Castel Durante, Gubbio, Pesaro, Caffaginolo, Urbino and Siena, because, in connection with the Hispano-Moresque and Siculo-Moresque relics in the same collection, they form an excellent historical vantage-ground from which to look at the ceramic art of Europe during the subsequent three hundred years. There is certainly ample room for contrast between the majolica of early Italy and that of England and France or Germany. One of the best specimens of the latter is from the Berlin porcelain manufactory. It consists of a wine-cooler of oval form and relief figures of mermaids, mermen and dolphins' heads. The moulding is excellent and the color is subdued and delicate. The same ware is used in many other exhibits from the same factory, such as a triangular basin decorated with aquatic plants, a large vase with Kaulbach's picture, *Emperor Otto in Charlemagne's Vault*, and a charming vase with *Groups of Children* after Rubens. All these will be found to compare very favorably with the exhibits in similar material of almost any of the other countries of Europe.

Among the French exhibits there is a greater variety of earthenware than is to be found in any other national section. The imitation Palissy-ware is striking, but repellent in the mass. The romance of Palissy's life is well known, but ever interesting. Born in 1510, he worked and traveled in the capacities of glass-painter, surveyor and draughtsman until he married in 1539. It was then that he began the search for pottery-enamel, and after sixteen years of misery and privation made the discovery which brought him distinction and immortality. His great merit was that he copied Nature, not only in color but in form, by turning from flat painting to colored relief. Thus we see fish, lizards, shells and plants of the district round Paris faithfully reproduced on the faïence of his workmanship. Of the French exhibitors at the Centennial, Barbizet shows the largest collection of imitation Palissy-ware. A few pieces are also shown by Brianchon, and some others may be found in the Swedish section. Barbizet is the son of the artist who is said to have rediscovered Palissy's method about half a century ago. He carries on the manufacture at Paris. Some of his pieces are creditable, but in the great majority it would be hard to find any trace of the distinctive quality of Palissy—his truth to Nature.

The great feature of the French section is the faïence of Limoges. It represents a new branch of the ceramic art. It was in 1737 that the first manufactory of faïence was founded at Limoges, and up to at least the beginning of the present century the faïence of Limousin was peculiar to that province. It did not acquire any wide celebrity, and that in Haviland's stand and the other pieces scattered through the silk department mark a new step in the manufacture. The artists of Limoges deserve credit in the first place for originality of form. Their vases resemble in shape nothing to be found elsewhere in the exhibition, and if we must find a precedent for them we shall be compelled to revert to the urns of the Anglo-Saxons and vases of ancient Britain. Even then we do not find an exact model. It is the decoration, however, which chiefly attracts our attention. The colors are in some cases superb and wonderfully massed. The drawing is characterized by great vigor, and there is everywhere visible a perfect freedom from conventionality. The figures are either painted on the flat surface

or moulded in relief and left unglazed. The latter method is well exemplified by a pair of vases showing respectively beautifully-carved figures of Apollo and Diana. Under the former method dogs, human figures and other forms are painted with a truth of coloring and breadth of drawing which stamp them as the works of great artists. A pair of large vases, twelve feet high, are intended to commemorate the beginning and the end of the first century of American independence. They were designed by Bracquemond and sculptured by Dela-

FAÏENCE VASE, LIMOGES.

planche. The former in attempting the achievement of something grateful to American patriotism has exposed himself to the danger of being accused of a lack of originality. The Stars and Stripes, the eagle, George Washington and the Goddess of Liberty, compose a quartet which, no matter how artistically they may be combined, pall at the present time upon the general taste of the American public. We say "at the present time" with intended emphasis, for the reason that the Centennial fever will soon subside, and then it will be decided that in

no more appropriate way than by these everlasting records could the event be commemorated. The vase representing the *Struggle for Independence* has a symbolical base of curling greenish and white waves in relief, and a circlet of cannon. It may be mentioned *en passant* that a similar base, but without the guns, is to be found in a pair of small Yokohama vases in the Japanese section, and that another pair of Tokio-ware show the same design in color. The body of the vase has a massive rotundity in proportion to the height. On the front is the American eagle with outspread wings, and a stand of colors occupies either side. Above the flags and eagle are the names of the signers of the Declaration, and a bust of George Washington surmounts the whole. Figures of *Victory* and *Fame* stand on either side of the blue starry cupola which gives completeness to the gigantic structures. In the companion vase, which represents *Prosperity*, the waves and rocks give place to implements of husbandry, fruits and grain; Washington is replaced by *America;* and the names of all the Presidents appear in front. The above description is sufficiently minute to make it clear that in Haviland's vases we have *the* ceramic feature of the exhibition. What we like about them best is their commemorative character. They appear to convey the greetings and good wishes of France to the Western republic in a manner so different from that which might have been expected from the French that we have no hesitation in ascribing them to American inspiration. The peculiarity of workmanship is, that the enamel is applied only to the ornamentation. The body, busts and figures are all left unglazed. It was a touch of genius also to get away from immediate usage to a style of ornamentation with which the potters of Magna Græcia and Apulia embellished their monumental vases. In criticising them it is essential that this character should be kept in view. They are no mere ornaments, but records. They mirror the first century of our life as a nation. They tell all that is to be found in American history, from the "struggle" of a hundred years ago to the "prosperity" of 1876. Their beauty is therefore half actual and half sentimental. Taken in detail, they command our admiration for their clear and subdued coloring, the elegance of the statuettes and the modeling of the busts. Taken as a whole, they are well balanced and admirably proportioned, and will hereafter form one of the most interesting memorials of the present year.

The exhibits of Limoges faïence lead irresistibly to the conclusion that the danger, some years ago incurred, of ruining the manufacture by the use of the porcelain style of ornamentation has been safely passed. Haviland has grasped the true idea, that faïence demands breadth, strength and effect in its decoration. He draws boldly, produces figures full of life and almost gifted with motion, and in his backgrounds occasionally brings out effects closely allied to those obtained on canvas. Let us look for a moment at his plaques and tiling. The former are like a revelation of the capacity of faïence for the display of artistic talent. Landscape and portrait are both shown, and in both we find the same strength and wonderful color. Tiling is represented by one large piece on which is painted an allegory of human progress. It offers us much, but it promises more. Nowhere else do we find the same flesh tint or an equal combination of correct drawing and happily-blended colors. When M. Bracquemond designed it he may fairly be suspected of having in view an illustration of the possibilities of his art as well as of human progress. We are not won by its beauty, but we cannot resist the appeal it makes to the artistic sense. Haviland has already succeeded in making Limoges faïence the standard of reference or comparison. How much more he may accomplish by keeping on in the course he has chosen we cannot measure.

A highly-interesting display is made by Sweden. The black "Northern faïence" is made into vases, tea-sets and other vessels which closely resemble those of porcelain. Plaques with raised floral ornamentation, and white majolica

similarly decorated, represent what appears a distinct branch of ceramic art. A tea-set has enamel ornamentation in blue, gilt, red and white, the latter resembling pearls and the blue turquoises. The best examples of this peculiar faïence are a stove or fireplace elaborately decorated in gilt, blue and green, and another representing a pillar surmounted by an eagle. In both the coloring is very chaste. An oddity presents itself in silver-plated porcelain, which may possibly be best described as the reverse of the Chinese enameling process. The exhibits as a whole display good taste and a fine perception of color. The Palissy-ware in particular is far less glaring and vulgar than much of that shown by France.

Leaving faïence, we naturally turn to the stoneware of England. The Messrs. Doulton have a collection which may be divided into three great divisions — the terra-cotta with stoneware ornaments, to

TOILET-SET IN TURQUOISE PÂTE TENDRE.

which reference has already been made, the Doulton-ware, and the Lambeth faïence. The second of these, we are told, is an English revival of the *gris de Flandres* of the fifteenth, sixteenth and seventeenth centuries. About the middle of the seventeenth century a number of Dutch potters established themselves at Lambeth, where the Doulton factory is situated, and continued the manufacture until the competition of the Staffordshire potters compelled them to abandon the pursuit. Subsequently (in 1815), Mr. John Doulton, the father of the present proprietors, founded the Lambeth factory. Under the sons this manufacture greatly increased in extent and excellence, and Lambeth is now one of the leading centres of English pottery. The "Doulton-ware" is a stoneware, brittle, dense, heavy and capable of resisting the action of acids. The "Lambeth faïence," which dates only from 1872, has many of the properties of porcelain, and is not, prop-

erly speaking, faïence, as the word was originally understood. A very fine specimen of its use in tiling is to be found in a picture of the *Departure of the Pilgrim Fathers*, by Mrs. Sparkes. In this the drawing is remarkably good, and far superior to the coloring. The various uses of tiles are well illustrated in the English exhibits. Mr. Doulton shows them in fireplaces and inserted in woodwork, and many of them present us with highly-artistic workmanship. The Doulton-ware and Lambeth-faïence vases are well worthy of their reputation. The ornamentation shows an almost endless variety of methods. It may consist of engraved figures or scrolls, incrustations in relief, painting or indented patterns. The natural result of such a wealth of resource is, that although the forms are consistently elegant, an occasional tendency evinces itself toward overloading the vases with decoration. The grand distinction between this and the Limoges faïence is in the formality of the patterns or figures. On the former, the vase being put into the hands of the decorator, he, in the greater number of cases, divides the surface into sections and repeats the same design in each. Less real variety is thus produced than by the less profuse art of France.

The Minton tiling is represented by several very beautiful specimens. It may be questioned, however, whether any of the English exhibitors of tiles are on the way toward the highest achievement of art. Their artists appear to keep correctness of drawing and brilliancy of color too exclusively in view. One of Minton's pieces, for example, has a deep-brown ground, on which are painted birds, water, reeds and flowers. The plumage is brilliant and very skillfully painted, the different shades of gray being admirably relieved by the rich blue wing-tips. In another brightly-plumaged birds are painted on a ground of dark chocolate, and in a third flowers and butterflies appear on a pale ground. A great number of plaques show a similar treatment. In all the ground is used merely for relief. The beauty of the details is unquestionable, but the natural and the artificial are unhappily combined. We might take as perfect specimens of drawing and color the lions', asses' and dogs' heads of Minton. But when we leave these and turn to animal or insect forms in landscape, we are confronted by the same style of treatment; and that is where the artists of England in a great many instances make a mistake. It is only occasionally that we find the work of an artist who fully comprehends that the ware under his hands is capable of telling all that has ever been told on canvas, provided he can master the requisite secrets of color.

Turkey shows a few earthenware vases of a green color. Russia exhibits nothing from the government works. The majority of the tiles and vases are productions of the schools, and are only interesting as indicating the attention bestowed upon art-education in the empire of the czar.

The porcelain exhibits we shall treat of without much detail. Domestic wares are met with almost everywhere. Those of Russia are very fine, but too expensive for general use. Some of the cups and saucers cost from twenty to thirty dollars, and though the shapes present attractive combinations of quaintness and elegance, they hardly appear to offer a sufficient return for such a price. The porcelain from the royal manufactory at Berlin is also very fine, and the edging is in many instances very chaste and artistic. But the best for all purposes is undoubtedly the French. Hache and Pepin-Lehalleur Frères devote their entire space to table and toilet vases. The ornamentation is often heavy to the verge of gaudiness, but in other specimens it is superb in both design and coloring. Before turning his attention to faïence Haviland was chiefly known by his table and toilet ware, and does more than maintain his past reputation. Some of his designs are remarkably good. In one dinner-set the knobs are modeled after different vegetables; in another, called the "water lily," the dishes and covers are shaped after that plant, and the ornamentation shows the flower itself. A dinner-set in *pâte tendre*, in which the knobs represent pheasants,

is, considering the difficulty of manipulating this material, a marvel of workmanship. The best specimen of *pâte tendre* is a turquoise-blue toilet-set, in which it would be hard to tell whether the transparent color or the moulding is the more beautiful. In treating of these we touch upon what is practically one of the most important features of ceramic art. It introduces beauty into the household. The beautiful and the useful are united, and if in seeking the latter we are brought into association with the former also, the gain is ours. Wherever in every-day life men see the results of cultivated taste, and handle the objects upon the formation and decoration of which it has been brought to bear, their own taste imperceptibly improves. The potter, in fact, teaches other things besides history. This consideration occurs to us apropos of the porcelain of Limoges, because in it, as in the faïence, there is an originality of design and a careful regard to

PORCELAIN VASES, FROM LIMOGES.

giving the design artistic form which we do not meet with elsewhere.

Several Sèvres vases are placed in Memorial Hall, and a few are to be found scattered through the jewelry and ceramic exhibits, but there is no regular collection. The Messrs. Daniell in the English section make a very rich and attractive display, the *Prometheus* vase in their centre case being a worthy rival of any other exhibit. Their vases with *pâte sur pâte* decoration are also entitled to unstinted praise. The vases, of which there is a great number, exhibited by the Berlin royal factory, are deserving of careful study and extended notice. The chief fault of the Berlin artists is in their drawing. It would be hard to find a precedent for some of their female forms, but they appear to possess a wonderful mastery of coloring.

Such are a few, and only a few, of the

ceramic features of the exhibition. From what has been said it will be seen that while some of the nations of antiquity continue to exercise an influence over the potters and artists of our day, different nations have certain distinct characteristics. This leads us to the truth that pottery is one of the most useful allies of history. It helps us to estimate the place of Greece in the art-education of the world. We can follow by its means the communion and movements of nations. We discover by its help the Western progress of Oriental ideas. We follow the Moors to Granada, to the Balearic Islands, to Sicily, to Italy, and mark from the pottery of their manufacture how they spread a ceramic art born in Arabia over the entire south of Europe. To follow the history of pottery would be to give an outline of general history. The records it has left have furnished keys to many a secret which would otherwise have remained locked. They reflect the manners, dress, customs and tastes of the times to which they belong, and by their help we may not only therefore study the present, but if we choose enter a wide gateway to the past.

DINNER-SET IN PÂTE TENDRE.

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